

## Recent trends of assimilation in Germany

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**Abstract**

This study investigates whether the life circumstances of immigrants and natives in Germany have converged within the last decades. Theoretically, the idea of social production functions is suggested as a general framework to integrate different assimilation approaches. Empirically, a method is used that combines the multivariate regression approach with common measures of segregation. This technique allows an easy assessment of assimilation trends taking into account relevant structural changes, in our case altering demographic compositions and the educational expansion. Immigrants and Germans are compared regarding central typologies of education, work, family, and place of residence through analyzing population censuses of 1970, 1989, and 1996. In spite of the fact that the educational gap has clearly widened over the years under observation, it will turn out that in respect of the other aspects of life the general trend appears to be towards assimilation, especially for the second generation of the 'classical' labor migrants.

## 1. Introduction

The question of whether there is a trend towards assimilation of immigrants in host societies is one of the most central problems of sociological studies on ethnic relations. If we disregard normative or ideological discussions in which the term ‘assimilation’ and its counterparts ‘multiculturalism’ or ‘pluralism’ are used as political programs, the issue is about whether we can expect (theoretically) or whether we observe (empirically) “the attenuation of an ethnic or racial distinction and the cultural and social differences that are associated with it” (Alba and Nee 1997, 834).<sup>1</sup> In our study we address this classical question once more, applying it in a very general way to the situation of the labor migrants and their descendants in Germany: If we consider the rough circumstances of life – i.e. the typical situation with regard to the central dimensions of education or work, family, and place of residence – is there a convergence between Germans and immigrants within the last decades?

Since the concept of assimilation has been subject to much debate, it is hard to find a clear theoretical prediction, even if we ignore the ideological rhetoric. Dealing with a special era of American immigration experience, the classical approaches of the Chicago School (e.g. Park and Burgess, 1921; Park, 1950; Gordon, 1964) seemed to view assimilation as an inevitable outcome of a multistage process, therefore leading to many objections concerning the universality of this result. At the other extreme some authors argue that segmentation rather than assimilation would be the expected outcome of intercultural contacts, resulting in scenarios of ethnic revivals, ethnic communities, or long lasting ethnic stratification (e.g. Hansen, 1938; Breton, 1964; Shibutani and Kwan, 1965; Glazer and Moynihan, 1970). Nowadays, most researchers would agree that a theoretical answer to the question of assimilation will not take the form of a simple ‘yes’ or ‘no’. Tendencies of convergence or divergence are dependent on a set of circumstances, i.e. on resources and opportunity structures which are affected by contextual and historical situations (Esser, 1990a). Below, we will suggest the concept of social production functions as a general framework to state this argument for several important dimensions of life. We will argue, that, although it is true that convergence is by no means a necessary and universal outcome of intergroup processes, there are strong reasons, why assimilation is very likely in modern societies in the course of time and generations.

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<sup>1</sup> Unfortunately, it still seems to be necessary to point out that this descriptive usage of the term ‘assimilation’ neither includes the notion that there ‘should’ be such a development, nor that the convergence is only conceivable as a one-way-street.

Empirical results also exhibit an ambiguous picture with regard to assimilation processes of labor migrants in Germany. The common denominator of most studies is that convergence is clearly evident, but that speed is often low and that assimilation is still far from being perfect, at least for some of the nationality groups. This general finding can be confirmed in the field of education (e.g. Esser, 1990b; Alba et al., 1994; Nauck, 1994), on the labor market (e.g. Velling, 1995; Bender and Seifert, 1996; Szydlik, 1996), and for processes of family building (e.g. Nauck, 1995; 1997). Most of these studies typically choose a certain variant of the regression approach (in a broader sense), in order to determine the effect of ethnicity on a particular aspect of life. The advantage of multivariate regression techniques is that they allow for a complex control of independent variables and their interplay on a specific dimension of social inequality. However, the disadvantage of this approach lies in the fact that it is sometimes hard to connect assimilation trends concerning several specific aspects to a summarizing general picture.

A quite different tool for the analysis of social inequality are indexes of segregation. While these instruments are very common in research on gender segregation in the labor market (e.g. Blau and Hendricks, 1979; Hakim, 1981; 1993; Handl, 1984; Karmel and McLachlan, 1988; Siltanen, 1990; Watts, 1992; Charles and Grusky, 1995) or on ethnic residential segregation (e.g. Massey and Denton, 1987; 1988), they have only seldom been used in the context of immigrants assimilation in Germany (a rare example is Velling, 1995). The strength of these measures is that they allow to describe complex structural patterns by one single quantity. In principle, the single measure characteristic leads to an easy assessment of inequality structures and can therefore also be used to prove or disprove assimilation trends. However, there are some serious problems concerning the temporal or contextual comparison of segregation indexes, since most measures tend to be affected by structural changes. This point has been subject to much debate in the literature of segregation indexes and several proposals have been made to solve this problem. While there have been important advances in dealing structural changes concerning 'dependent' variables (Blau and Hendricks, 1979; Handl, 1984; Karmel and McLachlan, 1988; Watts, 1992), little attention has been paid to other structural changes which may happen in 'independent' variables.

In our field of application, the general life circumstances of immigrants in Germany, an accounting for changes in at least two independent variables seems to be crucial for an adequate assessment of assimilation trends. On the one hand, due to the historical development of labor migration into Germany (recruitment of male workers in the 60's, afterwards processes of family reunion) the demographic structure of immigrants has changed

fundamentally. Since age and sex tend to be correlated with many aspects of life, this structural change may have had an impact on the convergence of immigrants and Germans in many respects. On the other hand, Germany – like other countries – experienced a massive educational expansion in the last decades. As a consequence, immigrants are not confronted with a fixed and clearly defined reference level of education, rather natives are constantly enlarging the existing gap. Since education has proved to be an important variable for explaining the integration of immigrants in Germany for nearly all dimensions (Esser, 1982; 1990b; Nauck, 1994), this development may impede the processes of convergence.

In order to give a proper assessment of assimilation trends in Germany taking into account demographic changes and the educational expansion, we use a straightforward link between the Index of Dissimilarity, which is the most common measure of segregation, and the Multinomial Logit Model. This technique combines the advantages of the segregation and the regression approach as it provides a summarizing picture of inequality structures controlling for relevant independent variables (Kalter, 2000; Spriggs and Williams, 1996).

While many studies referring to trends of assimilation in Germany rely on data which seem to be problematic with regard to sampling bias or selectivity due to panel mortality, we use large data sets coming from official sources to avoid such difficulties. More precisely, we analyze the ‘Volkszählung’ (population census) 1970, the ‘Mikrozensus’ 1989, and the ‘Mikrozensus’ 1996. Basically, we will conceive assimilation as the similarity of distributions over categories of certain relevant variables. We compare immigrants and Germans with regard to central typologies of the working situation, the family, and the place of residence at several points in time. In most respects the general trend tends towards assimilation, especially clear for the second generation of labor migrants. We start with a review and some additional theoretical considerations which mainly address two questions: Why should we expect assimilation at all, and why are demographic factors and education likely to affect the assimilation process? Then we describe the data and our basic method. Afterwards, we present our empirical results and discuss them in a final section.

## 2. Theory

Regarding the vast amount of literature devoted to the problem of immigrants' assimilation concerning several dimensions of life, it seems impossible to give a fairly comprehensive review. Therefore, rather than presenting theoretical arguments more or less arbitrarily in an additive way, we will follow a different strategy. We will concentrate on a single and very general theoretical idea, which in our view is implicitly common to diverse theoretical approaches. The focus of our considerations is the concept of social production functions. In this view, the typical circumstances of life – for example, working part-time without further school attendance, being married and having children, living in a small community – may be understood as a result from the choice between different strategies to produce highly valued goods. In the first section of our theoretical part, we will sketch the main idea and its connection to the process of immigrants' assimilation. Then, we will briefly demonstrate that the underlying argument can be found in many prominent theoretical contributions. Finally, we will show that the variable education – like standard demographic characteristics – is crucial within that framework and therefore may be important for an adequate understanding of ethnic inequality structures.

### 2.1 Why should we expect assimilation? – The concept of social production functions

The key concept of our theoretical considerations is the idea of social production functions, which can be traced back to Kelvin J. Lancaster (1966). It plays an important part in the new home economics, especially in the work of Gary S. Becker (e.g. Michael and Becker, 1973; Stigler and Becker, 1977; Becker, 1976; 1981). Based on the general economic assumption that individual actors behave as if they were trying to maximize their utility, the main focus of this framework is on the producer-side rather than on the consumer-side of human behavior. People derive utility from the consumption of commodities, which often cannot be simply purchased, but have to be produced by households. The inputs of production are marketable goods and factors like time, economic, human, cultural and social capital and so on. In Becker's framework, the output of commodities for a given amount of input is determined by so-called household production functions.

One can go on with this idea and assume, that some produced commodities may serve as an input to the production of a higher level commodities or goals. Lindenberg (1986; 1989)

argues that social approval and physical well-being may be regarded as the major goals at the top of this hierarchy. Further he suggests the more general term of ‘social’ production functions to transfer the idea of commodity production to social phenomena outside family behavior. What is even more important, the term also emphasizes that the conditions of production are dependent on social characteristics rather than being idiosyncratic circumstances. The social production functions are elements of social structure and a construction of the society. “A culture can be interpreted as having characteristic social production functions for various social positions in various social situations” (Lindenberg, 1989, 190).

Within the context of our topic, these considerations have two important consequences: First, ‘crude circumstances of life’ may be understood as types of investment strategies within the chain of production. Rather than being ‘pure’ exogenous tastes, preferences for specific occupations and employment types, eagerness to get marriage and have children, liking urban or suburban neighborhoods – at least to a certain degree – also result from their instrumental value for the achievement of higher level goals. Second, the outlined scheme involves a basic assimilation argument: In the receiving country immigrants are confronted with social production functions being already valid and often being different from those in their home country. To produce higher level goals as efficiently as the natives, immigrants will have to bring the same input. As a consequence, assuming they are equally interested in physical well-being and social approval in principle they will have to follow similar investment strategies concerning lower level goals.

However, there are also possibilities to define or construct alternative modes of production, e.g. in ethnic enclaves, but often it turns out that these are ‘mobility traps’ (Wiley, 1970) with respect to the higher levels of societies hierarchy. In spite of this, under certain conditions it may be quite rational to rely on such ethnic strategies. First, the host society may systematically restrict immigrants’ access to certain modes of production, manifesting in behavioral and institutional discrimination. Second, immigrants may be lacking the relevant input resources for the production of relevant commodities according to the rules of the host country (e.g. language skills, cultural knowledge, formal education). For the first generation this may mainly be due to former investment decisions, which have been chosen in respect of different social production functions and cannot be reversed without loss in other resources. Consequently, the more similar the modes of production in the source country and the host country, the greater the expected degree of assimilation. Although this problem becomes less severe for the following generations, one has to keep in mind that economic, social, and cultural capital is partly transmitted from parents to children. Accordingly, existing backlogs



are sometimes hard to catch up even for the second and third generation. In all these cases, the ethnic way of production may deliver a higher amount of a social approval and physical well-being.

## 2.2 The idea of social production functions in prominent assimilation theories

While the argument build around the social production functions still may sound very abstract, we will now try to make the mechanism clearer by detecting it in prominent assimilation approaches. It has been clear since the work of Milton Gordon (1964) that assimilation should be understood as a multidimensional concept. Although there are usually good reasons why assimilation with regard to one dimension should be conducive to assimilation with regard to other dimensions, this is not a perfect rule. Scenarios of so-called “uneven assimilation” (Price, 1969, 215ff) are absolutely possible. In the following discussion as well as in our empirical analyses below, we will concentrate on the three central dimensions of work, family, and housing.

### a) Economic assimilation

Economic assimilation is often regarded as the most important step in the process of integration (Esser, 1980, 231), as the resources for investments leading to social and spatial assimilation are mainly derived from the outcome of labor market processes. Dependent on the theoretical focus either income, status, prestige or quality of the job are seen as the decisive results of labor market processes. In terms of social production functions these outcomes comprise central commodities.

To understand the corresponding rules of production one may for example refer to some ‘classical’ approaches: According to the theory of human capital (e.g. Becker, 1975) income is seen as the return to skills in the labor market, most importantly education and on-the-job training. In their model of status attainment Blau and Duncan (1967) relate occupational status to education, social origin and social background. Following Treiman (1977) the level of prestige attributed to a certain occupation depends on the extent of control over scarce resources including skills, authority and property. The quality of a job is used to differentiate between the primary and secondary sector in the dual labor market theory (Doeringer and Piore, 1971). The theory of dual labor market posits that the allocation of workers to one of

the sectors cannot be entirely attributed to skill differentials, further that mobility between the two sectors is limited.

As income, status, prestige, and job quality are necessary input commodities for the production of many higher level goals (e.g. physical well-being and social approval), it is to assume that immigrants are interested in fair amounts of these quantities. As a consequence one would expect them to invest according to the valid rules in the labor market, therefore caring for the same skills or resources and aspiring to the same jobs as the natives in the course of time. However, there are a number of mechanisms which may prevent or at least decelerate such a process of economic assimilation.

For example, human capital acquired in the source country may not be transferable to the host country. Returns to foreign human capital seem to depend on the similarity between the origin and destination countries in terms of their level of economic development (see Borjas, 1994; Friedberg, 2000). In addition to that the proficiency in the host country's language and labor market experiences are likely to affect the rates of return. Being a member of an ethnic group per se can also affect the accumulation of human capital, as the average human capital level of a community determines the amount of human capital an individual can acquire (Lundberg and Startz, 1998; Borjas, 1994). However, all these mechanisms, which are related to the amount or value of human capital and which may prevent economic assimilation, seem to become less severe in the course of time and generations.

Another important barrier to economic assimilation is the existence of discrimination, which has been seen for example as a cause of a negative minority group affect on status attainment (Blau and Duncan, 1967, 239). The exclusion of groups of workers, like women or immigrants from the primary sector in a dual labor market can also be traced back to hiring decisions based on statistical discrimination, as employers perceive these groups to show low trainability or trustworthiness, high turnover rates and so on. However, theoretically in the long run most forms of discrimination are unlikely to occur under the conditions of a perfect market, as they imply higher production costs and therefore cannot be expected to be stable under competition (Becker, 1971, 21; Arrow, 1972, 192).<sup>2</sup>

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<sup>2</sup> In contrast to that, discrimination is seen to be stable under monopsonistic conditions (Madden, 1973) or if customers have 'tastes for discrimination' (Becker, 1971, 75ff). It seems doubtful, whether statistical discrimination may be a stable situation, since from a strict rational choice perspective beliefs may not survive if they are contradicted by empirical evidence (Arrow, 1998, 96). However, it can be shown that discriminatory beliefs of employers may be stable under certain conditions, if qualification investments of workers are regarded as endogenous in a model (Coate and Loury, 1993).

## b) Assimilation in family behavior

The idea of social production functions has been used explicitly in many explanations of immigrants' assimilation concerning family behavior. Most obviously, it is implied in the concept of the 'value of children' (VOC) developed in social psychology (Fawcett, 1972; Berelson, 1973; Hoffmann and Hoffmann, 1973) but also closely related to a general economic approach to fertility (Leibenstein, 1957; Becker, 1960; 1981). According to these ideas children may be viewed as central goods or means to achieve higher level goals, i.e. to produce certain basic utilities. Empirically, three dimensions turned out to be relevant (Kagıtcıbası, 1982): An economic-utilitarian aspect (financial help, help in old age, help around the house), a psychological-emotional aspect (pleasure of watching children grow, binding husband and wife closer together, fun to have young children), and a social-normative aspect (carrying on family name).

With regard to assimilative behavior of immigrants the importance lies in the strong influence of the structural context on the value of children. For example the economic and psychological 'cost' of children, and the institutional arrangements or opportunities to care (alternatively) for a living at older age are very different in Turkey and in Germany. Therefore, the act of migration presumably will lead to a fundamental change in the evaluation of parity (the number of children) or of the relative values attributed to sons and daughters (Nauck, 1997). Although a change in general preferences (e.g. weighting of economic vs. emotional aspects) may last considerably longer, a general convergence of immigrants' logic of the situation to that of the natives seems likely.

Relying closely on the economic approach to marriage and divorce (Becker et al., 1977; Becker, 1973; 1991) the general reasoning concerning fertility may easily be transferred to decisions concerning the family status. Staying single or getting married, staying married or getting divorced may also be conceptualized as decisions in order to optimize the production of certain commodities and hence the utility output. And again, the structural context plays an important part in the evaluation of the respective alternatives. While for example marriage still seems to be inevitable for females to give birth to a child in Turkey (Nauck, 1997), the German social system delivers much better support for unmarried mothers.

### c) Spatial assimilation

The study of immigrants' residential behavior has been an integral part of the Chicago School in the 1920s. The famous work of Park and Burgess (e.g. Park, 1926; Park and Burgess, 1925) prepared the ground for an extensive research on residential segregation and urban development. Although very influential, the nature of these classical studies is rather descriptive, and this holds also true for many of their successors. Therefore, in reviewing the main lines of past and current research, Massey (1985) tries to come to a more explanatory theory of ethnic residential segregation. The process of ethnic residential succession, well described by the ecologists of the Chicago School, can be deduced from the fact that later immigrants try to make use of their 'social capital' in form of personal connections or ethnic institutions (Massey, 1985, 317). These micro-motives lead to ethnic concentration, mainly in the cities, where early immigrants settled due to their economic situation. However, another process is counteracting these tendencies of concentration: the so-called process of 'spatial assimilation'. As the degree of acculturation (acquisition of language skills, values and manners) and socioeconomic status rise, immigrants more and more seek the same amenities (e.g. good schools) as the natives do. Therefore, over time they try to settle in neighborhoods predominated by the majority population, which are typically located in the suburbs (Massey, 1985, 329; Massey and Denton, 1987, 817f). The process of spatial assimilation and its link to the process of suburbanization has been empirically confirmed in many American studies (see Alba et al., 1999, 447).

It seems obvious to find the idea of social production functions within this reasoning. The important point is the shift of goals towards the better amenities, which may be conceived as instrumental goals in a chain of production. Rising contacts with the majority population and rising skills strongly increase the probability that these amenities indeed may be achievable. As a consequence, new ways to care for social approval (like having well educated children) or to care for physical well-being (like having a nice garden) are getting more and more open for immigrants of higher socioeconomic status.

### 2.3 The role of education

Using the idea of social production functions in the context of integration, immigrants are conceptualized as individual actors using available resources in order to produce certain

commodities. Some of these products are re-invested in order to produce higher level goals, and again these higher-level goals may be a necessary input for the achievement of other goals. At certain stages in this 'chain of production' the best way of investing depends on the set of resources already available, so some kinds of goods become key variables for the choice of the respective strategy. We will argue now that for many relevant choices concerning the basic patterns of life the level of education is of crucial importance.

This statement seems to be self-evident with regard to the labor market and the theory of human capital. Most obviously, a certain level of formal education is a necessary condition to enter most occupations. In addition to that, formal education may be interpreted as evidence of acquired skills or serve as a screening device for employers in order to estimate the unobservable performance ability (Arrow, 1973). While these statements are of a very general nature, it is to note that the connection between education and labor market position seems to be strong in Germany (Müller et al., 1998). Additionally, due to the so-called dual system the role of occupations in the labor market and segmentation along occupational lines seem to of special importance (Blossfeld and Mayer, 1988).

Furthermore, education strongly affects the choice of strategies with regard to family behavior (Nauck, 1997, 170–172). Firstly, one has to consider simple institutional effects resulting from a longer duration in the educational systems, leading to time-lags in the process of family building. But secondly, and of greater importance, there may be also effects beyond these temporal re-arrangements. Following the arguments of the economic approach to family behavior (Becker, 1973; 1981) it has to be assumed that women's gain from marriage will decrease with higher education as the expected profits in the labor market increase, thus reducing the profits of a sex-specific division of labor within a marriage (Diekmann, 1990). As a consequence one would expect lower marriage rates and higher divorce rates for higher educated women. A similar story holds for fertility. On the one hand with a rising level of education the opportunity structure widens, making adults less dependent on children to care for a living at older age or to help within and around the household. On the other hand, due to the enhanced chances in the labor market the opportunity costs for raising children will increase considerably.

Concerning the process of spatial assimilation the role of education is self-evident, since socioeconomic status is one of the central variables within the reasoning (see 2.1, above). Therefore, all in all we find that education plays an important part with respect to the choice of strategies in all three major dimensions of life.

### 3. Data

The data used in our analyses come from two sources. The first one is a 1-percent subsample of the 'Volkszählung 1970' (Census of Population 1970; ZUMA-File). The 'Volkszählung 1970' (VZ70) profiles the population in Germany with respect to demographic, regional and occupational information (Statistisches Bundesamt 1978). The second source is the 'Mikrozensus'. Begun in 1957 the Mikrozensus (MZ) is an annual 1-percent household survey of the population in Germany (Lüttinger and Riede, 1997). The MZ contains detailed data on a range of demographic and labor market variables. Our study uses a 70-percent subsample of the 1989 and 1996 MZ (ZUMA-File). Selecting these samples we tried to cover the largest possible range of time with respect to the coding of the nationality variable<sup>3</sup>. We restrict our analysis to respondents who reside in the Western part of Germany, because the VZ70 includes no information for people living in regions of Germany formerly belonging to the GDR.

We tried to measure the 'general circumstances of life' concerning education, work, family, and place of residence with typologies, which are sufficiently differentiated to catch the relevant differences. However, considering our basic method (see section 4) they should not be too differentiated to allow for meaningful comparisons over time. A further technical requirement was the possibility to construct equal typologies and codings for all three data sets. Against the background of these considerations we decided to use the following variables.

- The *sex-age-typology* was constructed using the combination of sex with an age scale of 10 year intervals (cut below 20 and over 60).
- *Education* was measured as the respondents highest level of school attainment using five categories, ranging from schooling not completed, only primary education, low level secondary education (8 years), middle level secondary education (10 years), to high level secondary education.
- The *labor force strategy* is a combination of respondents' educational and labor force participation at the time of the survey. It combines the extent of labor force participation, i.e. no labor force participation, marginally employed (less than 15 hours per week), part-time employed (15 to 34 hours per week) and full-time employed (more than 34 hours per

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<sup>3</sup> Because we are interested in differences between Germans and immigrants of different nationality groups it is not possible to use data from the MZ scientific use files available before 1989 as the nationality is only recorded as 'German' or 'other'.

week), with the current investment in some sort of formal education (no investment vs. investment) resulting in 8 categories. This typology may be interpreted as the respondents' current strategy of making a living. In addition we analyze two more variables describing the situation in the labor market in detail:

- The *industrial sector* groups industries into 10 divisions, while
- the *occupational status* refers to workers ("Arbeiter"), salaried employees ("Angestellte"), self employed persons, unpaid family workers, and apprentices.
- The *family type* variable describes the composition and marital status of the family members a respondent is actually living with, resulting in nine different categories. The family concept used for this typology is restricted to two generations.
- The *size of the community* where respondents reside is represented by three categories for all the included federal states except Saarland<sup>4</sup> (under 20 000, 20 000 to under 100 000 and 100 000 and more inhabitants).
- The *nationality* variable distinguishes between Germans, persons from Greece, Italy, Ex-Yugoslavia, Spain, Portugal, Turkey (summarized as 'labor migrants') and persons from other countries. Labor migrants belong to the *second generation* if they were born in Germany or immigrated till the age of six<sup>5</sup>. From the MZ96 data it is possible to identify respondents who have a dual citizenship (German and other). These are included in a separate category.

The categories of all variables are listed in Table 1 (see Appendix). The table shows the number of cases and column percentage of Germans and labor migrants for all three samples.

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<sup>4</sup> As Saarland is a small federal state only two categories (under 20 000 and more than 20 000 inhabitants) are distinguished.

<sup>5</sup> This information is not available in the data of the VZ70.

#### 4. Method – Combining the Index of Dissimilarity and the Multinomial Logit Model

We will now turn to the question how one should measure trends of assimilation empirically. Surely, the procedures most often used are variants of the regression approach, for example linear regression (Szydlik, 1996), path analysis (Esser, 1990b; Nauck 1994), logistic regression (Alba et al., 1994), tobit models (Velling, 1995), or event history analysis (Bender and Seifert, 1996; Nauck, 1997). The general technique to assess assimilation trends is to include ethnicity variables as independent variables into regression equations and to compare the effects of these variables over time. Since other independent variables and time-specific constants may also be controlled, this approach offers a flexible tool to analyze the complex interplay of different causes of social inequality and to account for structural changes as well in the dependent variable as in the independent variables. However, the picture expressed in coefficients and standard errors may become very complex, for example if the dependent variable consists of several nominal categories. As a consequence it may be hard to come to a short summarizing description of the underlying inequality structure and to compare it over time or between contexts. Consider for example the case of occupational segregation, where we may find different trends of assimilation concerning the likelihood of belonging to different industrial sectors.

This example reminds of a quite different tool for the analysis of ethnic inequality: indexes of segregation. The measures' common feature is the attempt to capture the degree of social inequality by one single quantity, even if the 'dependent' variable consists of several categories. The most prominent example is the Index of Dissimilarity (D), which is defined by

$$D = \frac{1}{2} \sum_{k=1}^J \left| \frac{A_k}{A} - \frac{B_k}{B} \right|,$$

where J is the number of categories of the dependent variable, A is the number of persons belonging to group A, B is the number of persons belonging to group B,  $A_k$  is the number of persons belonging to group A and category k and  $B_k$  is the number of persons belonging to group B and category k. The standard interpretation of D is that it expresses the proportion of members belonging to one of the two groups which had to move to an other category in order to achieve an equal distribution of both groups over all categories (Duncan and Duncan, 1955: 211; for a proof: Cortese et al., 1976, 634f).

In addition to the easy interpretation, the D has further convenient features (James and Taeuber, 1985; Massey and Denton, 1988). Surely, it is the index of segregation most frequently used in practical research. But, in spite of this fact, it is also true that it has been the



target of much criticism within the last decades. The most serious problem seems to arise from the fact that the index may be affected by structural conditions. Due to this, comparisons between contexts or between different time points are often difficult or even impossible. In the literature we find two different strategies to handle this problem. On the one hand researchers develop and propose new indexes, but until now no alternative has been broadly accepted as a convincing solution.<sup>6</sup> On the other hand some attempts have been made to solve the problem without discharging D completely, thus conserving its advantages. For example, there have been important advances in decomposing the changes over time into structural changes and changes of relative access (e.g. Blau and Hendricks, 1979; Handl, 1984; Karmel and McLachlan, 1988; Watts 1992).

The method used here is in line with the latter strategy, but in contrast to most previous work it focuses on structural changes concerning ‘independent’ variables rather than changes in the distribution of the (dependent) variable at interest itself. In this respect it seems obvious to combine the Index of Dissimilarity with the regression approach, thus conserving the advantages of both strategies: the single quantity characteristic and the possibility to control for independent variables. Like others (Spriggs and Williams, 1996) we rely on the Multinomial Logit Model (MNL) as a special variant of the regression analysis<sup>7</sup>, but unlike them we prefer ‘adjusting’ D instead of proposing a new index. It will turn out that the odds-ratio interpretation<sup>8</sup> of exponential MNL-coefficients is the key for the adjustment procedure, which we will now describe in detail (see also: Kalter, 2000).

The starting point for our considerations is the fact that D can be computed from the conditional probabilities of belonging to each of the categories of a variable at interest dependent on group membership (see formula above). The MNML allows one to regress these conditional probabilities on a set of independent variables as it is the extension of the logistic regression model to dependent variables with J nominal outcomes. In its general form the probability of an actor i belonging to category j is given by

$$\Pr(y_i = j | x_i) = \frac{\exp(x_i \beta_j)}{\sum_{k=1}^J \exp(x_i \beta_k)}$$

<sup>6</sup> For summarizing discussions see for example: James and Taeuber (1985), White (1986), Massey and Denton (1988), Massey et al. (1996), Kalter (2000).

<sup>7</sup> An attempt to use the linear probability model is made by Beller (1982) and discussed in Spriggs and Williams (1996: 350).

<sup>8</sup> The odds ratios also play an important part in the margin-free measure of segregation recently proposed by Charles and Grusky (1995).

where  $x_i$  is a vector containing the values of  $m$  covariates for person  $i$  and  $\beta_k$  is a vector of  $m+1$  parameters ( $\beta_{0k}, \beta_{1k}, \dots, \beta_{mk}$ ) for each  $k = 1, \dots, J$  (e.g. Long, 1997, 152). In order to identify the parameters it is common to choose one reference category and set the corresponding vector of parameters equal to a vector of zeroes.<sup>9</sup>

A convenient feature of the MNLM is the possibility to reproduce the column percentages of a  $J \times 2$  cross-table. If one chooses the variable containing the  $J$  categories as the dependent variable (with  $J$  being the reference category) and a dummy variable  $x_1$  for group membership ( $x_{1i} = 0$  for all  $i$  belonging to A and  $x_{1i} = 1$  for all  $i$  belonging to B) as the only independent variable, the column percentages may be expressed as in Table 2.

Table 2: Column percentages of a  $J \times 2$  table expressed by the Multinomial Logit Model

	group A $x_1 = 0$	group B $x_1 = 1$
Y=1	$\frac{\exp(\beta_{01})}{1 + \sum_{k=1}^{J-1} \exp(\beta_{0k})}$	$\frac{\exp(\beta_{01} + \beta_{11})}{1 + \sum_{k=1}^{J-1} \exp(\beta_{0k} + \beta_{1k})}$
...	...	...
Y = j	$\frac{\exp(\beta_{0j})}{1 + \sum_{k=1}^{J-1} \exp(\beta_{0k})}$	$\frac{\exp(\beta_{0j} + \beta_{1j})}{1 + \sum_{k=1}^{J-1} \exp(\beta_{0k} + \beta_{1k})}$
...	...	...
Y= J-1	$\frac{\exp(\beta_{0(J-1)})}{1 + \sum_{k=1}^{J-1} \exp(\beta_{0k})}$	$\frac{\exp(\beta_{0(J-1)} + \beta_{1(J-1)})}{1 + \sum_{k=1}^{J-1} \exp(\beta_{0k} + \beta_{1k})}$
Y = J	$\frac{1}{1 + \sum_{k=1}^{J-1} \exp(\beta_{0k})}$	$\frac{1}{1 + \sum_{k=1}^{J-1} \exp(\beta_{0k} + \beta_{1k})}$

Since D can be computed out of the column percentages, it can also be derived from the estimates of a Multinomial Logit Model. According to the definition of D and to Table 2 we find that:

<sup>9</sup> The parameters of the MNLM are estimated using the maximum-likelihood method. In our analyses below we used the method of 'individualized regressions' (Begg and Gray, 1984; Hosmer and Lemeshow, 1989), since the algorithms converged faster this way. For conducting 'individualized regressions' one creates  $J-1$  dummy variables (if there are  $J$  categories of the dependent variable) and sets them equal to one, if an individual belongs to the respective category, equal to zero, if an individual belongs to the reference category, and treats it as missing, if an individual belongs to neither. After that one estimates  $J-1$  (binary) logistic regressions using each of the  $J-1$  dummy as a dependent variable.

$$D = \frac{1}{2} \left( \sum_{k=1}^{J-1} \left| \frac{\exp(\beta_{0k})}{1 + \sum_{l=1}^{J-1} \exp(\beta_{0l})} - \frac{\exp(\beta_{0k} + \beta_{1k})}{1 + \sum_{l=1}^{J-1} \exp(\beta_{0l} + \beta_{1l})} \right| + \left| \frac{1}{1 + \sum_{l=1}^{J-1} \exp(\beta_{0l})} - \frac{1}{1 + \sum_{l=1}^{J-1} \exp(\beta_{0l} + \beta_{1l})} \right| \right)$$

As the index is size invariant (James and Taeuber, 1985) one can also compute D applying its standard definition (see page 14) to the following cross-table (Table 3).

Table 3: An odds table as a starting point for the computation of D

k	A <sub>k</sub>	B <sub>k</sub>
1	exp(β <sub>01</sub> )	exp(β <sub>01</sub> )·exp(β <sub>11</sub> )
...	...	...
j	exp(β <sub>0j</sub> )	exp(β <sub>0j</sub> )·exp(β <sub>1j</sub> )
...	...	...
J-1	exp(β <sub>0(J-1)</sub> )	exp(β <sub>0(J-1)</sub> )·exp(β <sub>1(J-1)</sub> )
J	1	1

The possibility of interpreting the MNLM in terms of an odds model is one of its useful properties (Hosmer and Lemeshow, 1989, 220–225; Long, 1997, 154). In our case, the elements contained in the cells of Table 3 are the odds of a member of the respective column belonging to the category of the respective row versus the reference category J. For each k the odds of the members of A are equal to exp(β<sub>0k</sub>). The odds of members of B are equal to the odds of A multiplied by the so-called odds ratio exp(β<sub>1k</sub>). The exponentiation of β<sub>1k</sub> yields the ratio of the odds of a B-person belonging to category k versus category J and the odds of an A-person belonging to category k versus category J. In this simple case with one independent dummy variable for group membership these odds ratios are identical with those obtained from the underlying cross-table.

As shown above, it is possible to include further independent variables into the model. Let us assume that we consider m-1 additional variables x<sub>2</sub>, ..., x<sub>m</sub> which leads to an estimate of m+1 parameters (β' <sub>0k</sub>, β' <sub>1k</sub>, β' <sub>2k</sub>, ..., β' <sub>mk</sub>) for each k = 1, ..., J. The exponentiation of β' <sub>1k</sub> now is still interpretable in terms of an odds ratio, but it is not the overall odds ratio resulting from the cross-table but the odds ratio holding all other variables constant (Long, 1997, 154). The expression exp(β' <sub>1k</sub>) may be seen as the factor by which the odds of a member of A must

be multiplied in order to get the odds of a member of B, assuming that both have the same values for all  $x_2, \dots, x_m$ .

In order to control for independent variables within D, our proposal now is to use these ‘controlled’ odds ratios instead of the overall odds ratios, or more precisely to compute an adjusted Index of Dissimilarity D’ from:

Table 4: An odds table as a starting point for the computation of D’

k	A <sub>k</sub>	B <sub>k</sub>
1	$\exp(\beta_{01})$	$\exp(\beta_{01}) \cdot \exp(\beta'_{11})$
...	...	...
j	$\exp(\beta_{0j})$	$\exp(\beta_{0j}) \cdot \exp(\beta'_{1j})$
...	...	...
J-1	$\exp(\beta_{0(J-1)})$	$\exp(\beta_{0(J-1)}) \cdot \exp(\beta'_{1(J-1)})$
J	1	1

We still use  $\beta_{0k}$  instead of  $\beta'_{0k}$  because this reflects the ‘mean’ covariate constellation of  $x_2, \dots, x_m$ , which seems more appropriate for our purposes than a constellation with the reference value for each covariate. As a result, we get the following definition:

The *Adjusted Index of Dissimilarity D’*, which is ‘holding constant the variables  $x_2, \dots, x_m$ ’, may be computed by

$$D' = \frac{1}{2} \left( \sum_{k=1}^{J-1} \left| \frac{\exp(\beta_{0k})}{1 + \sum_{l=1}^{J-1} \exp(\beta_{0l})} - \frac{\exp(\beta_{0k} + \beta'_{1k})}{1 + \sum_{l=1}^{J-1} \exp(\beta_{0l} + \beta'_{1l})} \right| + \left| \frac{1}{1 + \sum_{l=1}^{J-1} \exp(\beta_{0l})} - \frac{1}{1 + \sum_{l=1}^{J-1} \exp(\beta_{0l} + \beta'_{1l})} \right| \right),$$

where  $\beta_{0k}$  are the constants of a Multinomial Logit Model containing only a group membership dummy  $x_1$ , and  $\beta'_{1k}$  are the coefficients of  $x_1$  in a model also containing independent variables  $x_2, \dots, x_m$ .

The interpretation of D’ resembles that of D, it is only assumed that variables  $x_2, \dots, x_m$  are controlled for. A sufficient condition for  $D'=D$  would be that  $\beta'_{1k}=\beta_{1k}$  for all  $k = 1, \dots, J-1$ .

## 5. Results

Given the data and the method described above, we will try to answer the question whether there has been a convergence of Germans and immigrants concerning the rough circumstances of life between 1970 and 1996. The fields of interest are the level of education, type of family, size of community, labor market participation, industrial sector, and occupational status. The general method is to compare the dissimilarities of different immigrant groups to Germans over time. First, we compute the standard Index of Dissimilarity and then we compute adjusted indexes controlling for independent variables.

We start with the level of education because this variable plays an important part in our argument. As we have stated in section 2.3 education is a key variable for the production of many goods and therefore a crucial influence factor of life strategy choices. As shown in Table 1, Germans have experienced a massive educational expansion from 1970 to 1996. While only 3.7% of the Germans had a higher level secondary education in 1970 this percentage has risen to 14.9% in 1996 which is nearly four times as much. The educational level of labor migrants living in Germany also increased between these years, but on a far lower level and only with factor 3 (from 1.8% to 5.5%). Therefore, it is not surprising that the Index of Dissimilarity signals an increase in educational inequality since 1970 (Table 5).

Table 5: Dissimilarity to Germans concerning the level of education

	Index of Dissimilarity (standard)			adjusted Index, controlled for sex-age-groups		
	1970	1989	1996	1970	1989	1996
labor migrants on the whole	.18	.20	.24	.20	.22	.29
– Greeks	.15	.14	.15	.17	.17	.22
– Italians	.16	.17	.19	.22	.22	.28
– Yugoslavs	.23	.18	.15	.24	.20	.25
– Portuguese	.20	.20	.20	.18	.23	.26
– Spaniards	.18	.15	.10	.18	.18	.18
– Turks	.19	.25	.31	.16	.26	.32
labor migrants, 1 <sup>st</sup> generation		.25	.25		.30	.33
labor migrants, 2 <sup>nd</sup> generation		.60	.46		.17	.21
double citizenship*			.22			.10
remaining immigrants	.13	.23	.23	.15	.23	.22

\* In the Microcensus of 1996 respondents with double citizenship (German and foreign) were not asked about their place of birth and their year of immigration.

In addition to the general increase in educational inequality concerning all labor migrants (first data row of Table 5), we notice some remarkable differences between the nationalities. The trend of divergence seems to hold only for Italians and Turks, while the remaining four groups stagnated or even converged. However, the picture of the standard index is misleading, since there are remarkable differences in the demographic development of the different groups.<sup>10</sup> Since age tends to be correlated with education it is necessary to take these different developments into account. Therefore, the adjusted index controlling for the sex-age composition gives a more correct picture of the educational situation compared to Germans. Now, one finds an increase in educational dissimilarity between 1989 and 1996 for all labor migrants except for the Spaniards. Between 1970 and 1989 the educational differences stagnated for Greeks, Italians, and Spaniards, decreased for the Yugoslavs, and increased for the Turks and Portuguese. In 1996, the Turks have the greatest educational dissimilarity to the German population, followed by the Italians and the Portuguese. In contrast to these six groups of labor migrants, the remaining immigrants in Germany are closer to the educational pattern of the Germans. While they diverged between 1970 and 1989 they stagnate between 1989 and 1996.

The necessity to adjust for the sex-age-composition also becomes obvious if we distinguish between the first and second generation of labor migrants. The values of the standard Index of Dissimilarity are extremely high for the second generation, which may be due to the fact that this relatively young subgroup is compared to the total age spectrum of Germans. In contrast to this, the adjusted index shows that the second generation is more similar to the German population than the first. However, even for the second generation we find an increase in educational inequality between 1989 and 1996.

All in all the educational situation of the six classical groups of labor migrants shows a trend of convergence to Germans over generations, but a trend of divergence over time.

We will now turn to the typology called 'labor force strategy' representing a persons' amount of labor force participation in combination with his actual investment in any kind of education (Table 6). According to the standard Index of Dissimilarity we find a distinct decrease in inequality for the labor migrants between 1970 and 1996. But, again we find implausible

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10 For example, many of the former Greek, Portuguese, Spanish, and Italian labor migrants re-migrated in the years after the "Anwerbestopp" in 1973, while far more Turkish migrants stayed and got their family members come to Germany. Concerning the Yugoslavs, the civil war at the beginning of the 90's and the ongoing ethnic conflicts since then have led to a new inflow of mostly younger refugees.

results concerning the differences between the first and the second generation. Like in the case of education, this may be due to different demographic compositions. Therefore, a control for age and sex gives a better answer, and in general we find the same rough tendencies in this case. However, there is a slight increase in dissimilarity for Yugoslavs, Italians, and – above all – Turks between 1989 and 1996. But except for the Turks these reverse tendencies happen on a rather low absolute level of dissimilarity and therefore should not be overinterpreted. The distinction between the first and second generation reveals, that the increase in dissimilarity is mainly taking place in the former group.

Table 6: Dissimilarity to Germans concerning the labor force strategy

	Index of Dissimilarity (standard)			adjusted Index, controlled for sex-age-groups			adjusted Index, controlled for sex-age-groups and education		
	1970	1989	1996	1970	1989	1996	1970	1989	1996
labor migrants on the whole	.40	.14	.07	.36	.07	.17	.39	.08	.12
– Greeks	.35	.20	.12	.37	.09	.05	.42	.16	.10
– Italians	.34	.14	.10	.34	.06	.09	.35	.08	.02
– Yugoslavs	.51	.19	.10	.47	.08	.10	.48	.15	.06
– Portuguese	.43	.15	.12	.40	.05	.04	.41	.11	.08
– Spanish	.37	.19	.09	.31	.12	.03	.34	.15	.04
– Turks	.41	.13	.13	.28	.15	.25	.32	.10	.20
labor migrants, 1 <sup>st</sup> generation		.23	.13		.09	.22		.12	.15
labor migrants, 2 <sup>nd</sup> generation		.40	.30		.10	.13		.06	.09
double citizenship*			.16			.13			.12
remaining immigrants	.12	.04	.07	.05	.18	.19	.10	.21	.20

\* In the Microcensus of 1996 respondents with double citizenship (German and foreign) were not asked about their place of birth and their year of immigration.

Since the level of (completed) education should be a major influence factor for the current labor force strategy, it is of interest whether current dissimilarities between the different groups of immigrants and Germans are possibly due to the educational gap reported in Table 5. Therefore, the last three columns of Table 6 show the adjusted Index of Dissimilarity also controlling for education. Although there are some exceptions, in principal this furthermore reduces the amount of current dissimilarity.

Altogether there is a clear trend towards assimilation of labor force strategies for the labor migrants between 1970 and 1996. Except for the Turks, and except that for some groups slight reverse tendencies show up since 1989, the level of dissimilarity in 1996 is rather low, especially for the second generation.

We will now take some deeper view at assimilation tendencies concerning the labor market by looking on segregation in the industrial sector and in the occupational status of those who are currently (at least 15 hours per week) employed (Table 7 and Table 8).

Table 7: Dissimilarity to Germans concerning the industrial sector

	Index of Dissimilarity (standard)			adjusted Index, controlled for sex-age-groups			adjusted Index, controlled for sex-age-groups and education		
	1970	1989	1996	1970	1989	1996	1970	1989	1996
labor migrants on the whole	.33	.28	.19	.33	.28	.18	.28	.24	.18
– Greeks	.49	.30	.26	.49	.31	.26	.48	.31	.27
– Italians	.37	.24	.19	.36	.24	.19	.33	.24	.20
– Yugoslavs	.36	.29	.19	.37	.32	.19	.35	.26	.19
– Portuguese	.42	.31	.23	.41	.31	.24	.38	.27	.19
– Spaniards	.37	.30	.19	.36	.31	.20	.34	.26	.20
– Turks	.43	.34	.26	.42	.33	.24	.41	.27	.19
labor migrants, 1 <sup>st</sup> generation		.30	.22		.30	.21		.25	.20
labor migrants, 2 <sup>nd</sup> generation		.20	.15		.19	.14		.19	.12
double citizenship*			.14			.14			.13
remaining immigrants	.10	.11	.12	.13	.11	.11	.09	.11	.11

\* In the Microcensus of 1996 respondents with double citizenship (German and foreign) were not asked about their place of birth and their year of immigration.

Concerning the industrial sectors the picture is very clear. There has been a steady desegregation from 1970 to 1996. This is visible as well in the standard Index of Dissimilarity as in the indexes adjusted for age and sex, and adjusted for age, sex, and education. In addition to that, the segregation is higher for the first generation than for the second generation. On the whole, the trend to assimilation is obvious as well over time as over generations.

The same holds true for the occupational status (Table 8), although the speed of assimilation seems to be rather low here! The standard Index of Dissimilarity dropped from .50 in 1970 to .41 in 1996, and the amount of dissimilarity is nearly unaffected controlling for the sex-age-composition. Generally, the control of education reduces the reported gap, but only slightly. Therefore, the still remarkable differences of labor migrants can only partly be attributed to the educational gap. Nevertheless, while the general level of dissimilarity is still rather high, the situation is very different for the second generation! If we control for age and sex we find a value of .23 in 1996, which reduces to .13 if one additionally controls for education. On the whole, accounting for the educational developments in Germany, we find a



slight assimilation over time and a massive assimilation over generations concerning the occupational status.

Table 8: Dissimilarity to Germans concerning the occupational status

	Index of Dissimilarity (standard)			adjusted Index, controlled for sex-age-groups			adjusted Index, controlled for sex-age-groups and education		
	1970	1989	1996	1970	1989	1996	1970	1989	1996
labor migrants on the whole	.50	.44	.41	.50	.45	.41	.51	.43	.39
– Greeks	.51	.41	.34	.51	.42	.35	.51	.43	.35
– Italians	.48	.34	.32	.48	.34	.32	.47	.31	.26
– Yugoslavs	.50	.46	.42	.50	.47	.43	.52	.47	.43
– Portuguese	.51	.43	.42	.52	.44	.44	.51	.41	.38
– Spaniards	.48	.40	.29	.48	.41	.32	.47	.39	.34
– Turks	.53	.49	.49	.53	.51	.47	.53	.49	.45
labor migrants, 1 <sup>st</sup> generation		.48	.47		.48	.47		.47	.46
labor migrants, 2 <sup>nd</sup> generation		.39	.34		.28	.23		.23	.13
double citizenship*			.23			.24			.35
remaining immigrants	.11	.04	.12	.10	.02	.12	.22	.20	.26

\* In the Microcensus of 1996 respondents with double citizenship (German and foreign) were not asked about their place of birth and their year of immigration.

Turning to the family typology and looking at the corresponding distributions in Table 1 we find changes in the German population which are well-known. Most remarkably there is a steady decline of the normal nuclear family, i.e. married couples with at least one child. While this is the typical style of living for nearly one third of the population in 1970, it is the way only one quarter of the population lives in 1996. The percentage of people still living with their parents also sharply decreased within the observed time interval. Instead we find notable increases in married couples without children, divorced people, and unmarried people living apart from their parents. The labor migrants in Germany seem to follow these tendencies since 1989 even if the trends are only slightly developed. However, from 1970 to 1989 dramatic changes occurred, often in the opposite direction. It seems sensible that this mostly results from the historical course of labor migration and the involved demographic changes of the immigrant population. Therefore, again it seems necessary to use an adjustment for age and sex when measuring the dissimilarity to Germans (Table 9).

Controlling for the sex and age composition there is a clear decline of family type dissimilarity from 1970 to 1996. This holds true as well for the labor migrants as a whole as for each of the six groups. The spectrum ranges from the Spaniards, being nearly similar to Germans, to the Turks, showing still notable differences to Germans. In addition to that, the picture gets even clearer when looking only at the second generation of labor migrants. If one controls also for education the measures of dissimilarity change only slightly. It seems that the remaining differences to the family behavior of Germans have nothing to do with the educational gap denoted earlier.

Table 9: Dissimilarity to Germans concerning the type of family

	Index of Dissimilarity (standard)			adjusted Index, controlled for sex-age-groups			adjusted Index, controlled for sex-age-groups and education		
	1970	1989	1996	1970	1989	1996	1970	1989	1996
labor migrants on the whole	.23	.26	.26	.39	.25	.24	.39	.24	.24
– Greeks	.17	.24	.22	.39	.21	.15	.39	.19	.15
– Italians	.18	.20	.19	.29	.17	.16	.31	.15	.15
– Yugoslavs	.43	.19	.19	.52	.24	.20	.51	.23	.20
– Portuguese	.25	.20	.15	.42	.25	.23	.43	.22	.23
– Spaniards	.18	.20	.15	.33	.13	.06	.34	.12	.06
– Turks	.27	.33	.34	.40	.32	.29	.40	.31	.29
labor migrants, 1 <sup>st</sup> generation		.36	.35		.32	.35		.31	.35
labor migrants, 2 <sup>nd</sup> generation		.64	.58		.12	.10		.13	.09
double citizenship*			.22			.17			.17
remaining immigrants	.14	.14	.13	.29	.20	.22	.28	.21	.23

\* In the Microcensus of 1996 respondents with double citizenship (German and foreign) were not asked about their place of birth and their year of immigration.

The last aspect of life considered here is the place of residence. Unfortunately, the scientific use files derived from official statistics data sets do not include the information we would need to refer more closely to the predictions of the spatial assimilation model. The main problem is that we can not decide whether a person is residing within the inner city or within a suburban context. Therefore we have to look at the only given information, the size of the community. In 1970 the labor migrants tended to be overrepresented in the bigger cities and this characteristic got even more pronounced until 1989 (Table 1). However, the German population also moved away from the smaller towns even though on a lower level. From 1989 to 1996 this tendency is slightly reversing, now more distinctively for the labor migrants.

Table 10: Dissimilarity to Germans concerning the size of community

	Index of Dissimilarity (standard)			adjusted Index, controlled for sex-age-groups			adjusted Index, controlled for sex-age-groups and education		
	1970	1989	1996	1970	1989	1996	1970	1989	1996
labor migrants on the whole	.17	.20	.19	.17	.22	.20	.19	.23	.21
– Greeks	.17	.27	.26	.18	.27	.27	.19	.28	.27
– Italians	.13	.17	.15	.14	.18	.16	.16	.20	.17
– Yugoslavs	.16	.22	.17	.16	.23	.18	.18	.24	.20
– Portuguese	.16	.23	.16	.17	.23	.16	.19	.25	.18
– Spaniards	.22	.24	.20	.23	.25	.21	.25	.26	.21
– Turks	.18	.21	.20	.19	.23	.22	.21	.25	.23
labor migrants, 1 <sup>st</sup> generation		.20	.19		.20	.18		.23	.20
labor migrants, 2 <sup>nd</sup> generation		.20	.19		.25	.22		.25	.23
double citizenship*			.07			.09			.08
remaining immigrants	.13	.19	.15	.14	.19	.16	.12	.17	.14

\* In the Microcensus of 1996 respondents with double citizenship (German and foreign) were not asked about their place of birth and their year of immigration.

Assessing these developments with the measures of dissimilarity, we find a pattern of slight divergence from 1970 to 1989 and one of slight convergence from 1989 to 1996 (Table 10). Controlling for age, sex, and education leaves the measures nearly unchanged.

## 6. Summarizing discussion

Finally, what may be said about the concept of assimilation and its relevance for the situation of the labor migrants and their descendants in Germany? We suggested to free the term from its ideological and political connotations (and the corresponding debates) and to understand it empirically as the convergence of distributions over categories of relevant variables. Relying on nearly unbiased data and using a method which combines the segregation approach with regression tools, we can principally confirm a frequent finding: trends of assimilation are unmistakable, but as a general rule far from being perfect.

Above all, education seems to be the most critical variable concerning the convergence of immigrants' life circumstances to those of the natives. On the whole, within the last decades the educational gap even widened. All the more it is remarkable, that the rough outlines of the 'ways of life' clearly approached to the Germans at the same time in respect of the other dimensions. In particular this holds true for the general strategy in the labor market. Additionally, segregation by industrial sectors and differences in the types of family decreased strongly. The trend is also identifiable for the occupational status, however it is necessary to note that the degree of dissimilarity is still rather high with respect to this variable. Solely the slightly different spatial distribution of immigrants remained nearly unchanged over time. Our results also provide interesting information with regard to differences between the nationalities and predominantly confirm findings of other studies. On the whole the Turks are the most dissimilar group to Germans, followed by – and this may be a little surprising – the small group of Portuguese. On the other hand the Spaniards who still live in Germany seem to be the most assimilated group, they now even outdistanced the Greeks with regard to education.

The most important result, however, concerns the differences between the generations. Except for the size of community, dissimilarity to Germans has sharply decreased from the labor migrants to their descendants grown up in the host country for all aspects of life. Controlling for the demographic composition and for education remaining differences of the second generation to comparable natives are on a rather low level with respect to the working and family situation. However, education still seems to be a problematic matter since the gap to coeval Germans even increased for the second generation between 1989 and 1996. While this fact only slightly affects the other dimensions, it seems to be the main cause of the remaining disadvantages concerning the occupational status.

Surely, a severe restriction of our approach is that we do not use longitudinal data on an individual basis. Therefore, our assessment of assimilation remains on the group level, neglecting the difficulties resulting from in- and out-migration and failing to control or detect the interesting intra-individual and intra-family-inter-generational processes. However, just these migration movements make it nearly impossible to collect unbiased data over a comparable time span using a panel or retrospective design. This resolves from the fact that theoretically the likelihood of outmigration is correlated with the degree of assimilation and the degree of assimilation is dependent on the duration of stay in the receiving society. Therefore our 'macro view' on assimilation may be understood as an additional information about immigrants' life situation, lacking some advantages of micro longitudinal approaches while avoiding some of its disadvantages.

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## Appendix

Table 1: Number of cases and column percentages of relevant variables

	<u>VZ70</u>		<u>MZ89</u>		<u>MZ96</u>	
	Germ.	LabMig	Germ.	LabMig	Germ.	LabMig
<b>age-sex-composition</b>						
male under 20	15.0%	10.5%	10.1%	18.4%	10.0%	17.7%
male 20 to 29	6.7%	19.0%	8.6%	9.5%	6.5%	10.5%
male 30 to 39	7.2%	24.1%	7.0%	7.1%	8.0%	8.5%
male 40 to 49	5.8%	9.1%	6.6%	10.9%	6.7%	6.5%
male 50 to 59	4.4%	2.0%	6.7%	6.6%	7.1%	7.2%
male over 60	8.1%	0.6%	8.4%	1.3%	9.6%	2.7%
female under 20	14.3%	10.3%	9.7%	18.1%	9.7%	16.4%
female 20 to 29	6.3%	11.7%	8.5%	8.1%	6.4%	9.6%
female 30 to 39	7.0%	8.2%	6.9%	7.9%	8.0%	7.2%
female 40 to 49	6.9%	3.2%	6.6%	7.4%	6.7%	7.1%
female 50 to 59	6.1%	0.8%	6.9%	3.8%	7.2%	4.7%
female over 60	12.3%	0.5%	14.1%	0.9%	14.1%	1.9%
<i>n =</i>	<i>591328</i>	<i>19784</i>	<i>354696</i>	<i>18215</i>	<i>372430</i>	<i>22669</i>
<b>education</b>						
schooling not completed at the time of survey	14.4%	6.0%	10.0%	19.8%	11.5%	17.7%
only primary education	11.4%	10.3%	7.8%	15.7%	12.8%	30.0%
low level secondary education (8 years)	61.5%	79.2%	51.6%	53.7%	43.5%	39.7%
middle level secondary education (10 years)	9.0%	2.7%	17.3%	6.4%	17.3%	7.0%
higher level secondary education (13 years)	3.7%	1.8%	13.3%	4.4%	14.9%	5.5%
<i>n =</i>	<i>591328</i>	<i>19784</i>	<i>354696</i>	<i>18215</i>	<i>372430</i>	<i>22669</i>
<b>family type</b>						
married couple, without children	17.5%	18.8%	21.5%	10.3%	23.8%	12.1%
married couple with child(ren)	31.3%	25.2%	27.0%	37.0%	24.5%	36.0%
divorced or widowed without children	8.3%	2.0%	10.5%	2.1%	10.6%	2.6%
divorced or widowed with child(ren)	2.2%	0.4%	2.4%	1.0%	2.1%	1.4%
never married with child(ren)	0.2%	0.2%	0.5%	0.3%	0.7%	0.6%
married, separated without children	1.0%	12.4%	0.8%	4.1%	1.1%	2.1%
married, separated with child(ren)	0.3%	1.0%	0.3%	0.6%	0.4%	0.7%
never married, no children, not living with parents	4.7%	14.1%	10.1%	5.1%	11.6%	5.8%
never married, no children, living with at least one of the parents	34.6%	26.0%	27.0%	39.6%	25.4%	38.8%
<i>n =</i>	<i>581940</i>	<i>14124</i>	<i>354696</i>	<i>18215</i>	<i>372430</i>	<i>22669</i>
<b>size of community</b>						
under 20,000 inhabitants	51.4%	35.1%	41.0%	21.3%	42.2%	23.5%
20,000 to under 100,000 citizen	19.7%	24.4%	26.0%	25.7%	26.2%	27.6%
100,000 and more	28.2%	40.1%	32.0%	52.2%	30.6%	48.4%
Saarland: 20,000 and more	0.7%	0.4%	0.9%	0.8%	0.9%	0.5%
<i>n =</i>	<i>591328</i>	<i>19784</i>	<i>354696</i>	<i>18215</i>	<i>372430</i>	<i>22669</i>

(Table 1 continued)

<b>labor force strategy</b>						
no school attendance, no labor force participation (reference category)	41.4%	15.5%	41.5%	31.2%	41.0%	39.3%
no school attendance, labor force participation: less than 15 hours per week	0.7%	0.3%	1.0%	0.3%	2.2%	1.8%
no school attendance, labor force participation: 15 to 34 hours per week	3.6%	1.4%	5.2%	2.3%	6.3%	3.6%
no school attendance, labor force participation: 35 hours and more per week	35.8%	75.6%	36.4%	41.1%	33.8%	32.1%
school attendance, no labor force participation	16.0%	6.3%	13.4%	22.5%	14.2%	20.1%
school attendance, labor force participation: less than 15 hours per week	0.02%	0.01%	0.1%	0.04%	0.4%	0.2%
school attendance, labor force participation: 15 to 34 hours per week	0.2%	0.1%	0.1%	0.1%	0.3%	0.2%
school attendance, labor force participation: 35 hours and more per week	2.4%	0.8%	2.4%	2.5%	1.9%	2.8%
<i>n =</i>	<i>591328</i>	<i>19784</i>	<i>354696</i>	<i>18215</i>	<i>372430</i>	<i>22669</i>
<b>industrial sector</b>						
agriculture, forestry and fisheries	7.8%	0.8%	3.8%	0.7%	2.9%	1.3%
mining and utilities	2.0%	1.9%	1.8%	2.4%	1.6%	1.5%
manufacturing	37.6%	68.5%	31.4%	55.7%	26.5%	42.1%
construction	7.4%	14.8%	6.7%	10.3%	7.9%	11.5%
trade	12.6%	2.5%	12.5%	6.4%	13.4%	10.0%
transportation and communication	5.7%	2.6%	5.9%	3.4%	5.5%	4.5%
finance and insurance	2.7%	0.3%	3.9%	0.8%	4.3%	1.1%
service industries	13.9%	7.4%	21.7%	18.1%	27.1%	25.3%
membership organizations and private households	1.4%	0.4%	1.8%	0.6%	1.4%	0.7%
public administration and social security	8.9%	1.0%	10.7%	1.6%	9.6%	2.0%
<i>n =</i>	<i>247741</i>	<i>15409</i>	<i>156212</i>	<i>8367</i>	<i>157708</i>	<i>8755</i>
<b>occupational status</b>						
worker	42.8%	92.9%	35.9%	79.9%	31.2%	69.7%
salaried employee	34.2%	4.8%	45.9%	9.6%	52.1%	16.2%
self employed	10.6%	1.0%	10.1%	5.2%	11.5%	6.8%
unpaid family worker	6.8%	0.4%	2.0%	0.4%	1.1%	0.6%
apprentice	5.7%	0.9%	6.2%	4.9%	4.1%	6.7%
<i>n =</i>	<i>227415</i>	<i>15396</i>	<i>141261</i>	<i>8367</i>	<i>143722</i>	<i>8739</i>
<b>nationality</b>						
German	100.0%		100.0%		100.0%	
Greek		16.7%		9.2%		8.1%
Italian		26.0%		16.6%		13.4%
(Ex)Yugoslavian		21.4%		17.9%		23.1%
Portuguese		2.4%		1.9%		2.3%
Spanish		12.0%		4.4%		2.8%
Turkish		21.5%		49.9%		50.5%
<i>n =</i>	<i>591328</i>	<i>19784</i>	<i>354696</i>	<i>18215</i>	<i>372430</i>	<i>22669</i>
<b>generation</b>						
first (immigrated to Germany more than 6 years old)	--	--	--	63.3%	--	57.0%
second (born in Germany or immigrated till age of 6)	--	--	--	36.7%	--	39.2%
double citizenship	--	--	--	--	--	3.8%
<i>n =</i>				<i>17405</i>		<i>20525</i>