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Patterns of intergenerational mobility of the old and new middle classes in a post-industrial society: Netherlands 1970–2006

Ayse Güveli [a,*], Ruud Luijkx [b], Harry B.G. Ganzeboom [c]

[a] Department of Sociology, University of Essex, UK
[b] Department of Sociology, University of Tilburg, The Netherlands
[c] Department of Sociology, Free University Amsterdam, The Netherlands

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ABSTRACT

It has often been proposed that new cleavages have emerged within the middle class. In this paper, we examine the distinction between social and cultural specialists and technocrats, and investigate whether these new and old middle class fractions are differentiated by their patterns of intergenerational mobility. *To what extent do these newly distinguished middle class fractions have specific external and internal intergenerational mobility patterns*? And *to what extent have mobility boundaries between them been rising over time*? To answer these questions, we use 47 Dutch national population sample surveys with detailed occupation codes collected between 1970 and 2006 ($N = 60{,}978$). Our analyses of internal and external homogeneity show that the middle class fractions each have characteristic mobility and immobility patterns and therefore a necessary condition is satisfied to declare them as separate classes. Furthermore, in the early periods, the social and cultural specialists were differentiated by a high level of immobility but in the later periods, the distance between the old and new middle classes has decreased significantly.

1. Introduction

Since the 1970s, many students of stratification have argued that there exist multiple fractions within the middle class and that in post-industrial societies some of these fractions have become social classes in their own right. However, to what extent have these fractions of the middle class acquired separate demographic identities? Following Weber's (1978 [1922], p. 302) famous *dictum* that "a 'social class' makes up the totality of those class situations within which individual and generational mobility is easy and typical", mobility analysts (Breiger, 1981; Goldthorpe, 2000) have argued that a social category does not constitute a social class proper unless there is considerable intergenerational reproduction of class membership. Members of social classes experience similar upward and downward mobility patterns within a society. Conversely, only occupational categories that are similar with respect to intergenerational mobility flows constitute a single social class. By implication, if the fractions within the middle class do indeed constitute distinct classes, their intergenerational mobility patterns should clearly differ.

In this paper, we examine the intergenerational reproduction and mobility patterns of middle-class fractions in the Netherlands, an advanced post-industrial society for which a wealth of detailed intergenerational mobility data are available. We concentrate on the distinction between the middle-class fractions of 'technocrats' and 'social and cultural specialists' that was proposed by Kriesi (1989a,b) and which has been rigorously operationalized by Güveli (2006). While only one specific form of new class formation, we maintain that Kriesi's distinction is a fair summary of many of the new class conceptions

* Corresponding author. Address: Department of Sociology, University of Essex, Wivenhoe Park, Colchester CO4 3SQ, UK. Fax: +44 1206 873410.
E-mail address: aguveli@essex.ca.uk (A. Güveli).

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proposed by others. Earlier research by Güveli and associates has confirmed its validity with respect to external criteria, such as political preferences (Güveli et al., 2007a; Lubbers and Güveli, 2007), life styles (Güveli et al., 2007b) and life course development (Güveli and De Graaf, 2007). To do this research, we add a validation with respect to intergenerational occupational mobility, which we believe – in line with Weber's *dictum* – is the core issue in assessing class boundaries.

1.1. Theoretical background: The 'new class' debate

Views have varied on how to conceptualize middle-class fractions and how to validate the distinctions made between them. Before notable others (Gouldner, 1979), Bell (1973) was among the first to announce the coming of the post-industrial society and to discuss the emergence of new classes in this context. He argues that post-industrial societies depend on knowledge-based services that invoke an increased demand for 'quality of life' in health, education, social services, research and the arts. Bell claims that "the major class of the emerging new society is primarily a professional class, based on knowledge rather than property" (Bell, 1973, p. 374). The new social class does not necessarily include newly emerging occupations. In fact, professional occupations have been there from ancient times. Social trends and modes of production prevailing in post-industrial societies make these occupations develop new class interests and specific mobility patterns.

A host of new class theorists has followed Bell's lead and used knowledge criteria to delineate the new class. Brint (1984) compares several conceptualisations of the "old" and "new" middle class to explain why some middle-class members have liberal attitudes and concludes that educational differences explain most of the variations. Accordingly, the class fractions Brint distinguishes are based on educational criteria, a view that concurs with Wright's (1985, p. 87) conception that uses organizational and skill/credential "assets" as a way to introduce professional work into an otherwise Marxist class scheme. Lamont (1987) considers "cultural capital workers" as a new class, with a claim that a common class interest explains their progressive attitudes. These common interests are to maintain and increase intellectual autonomy, to have a powerful and large public sector, to raise taxes for the public good and implement liberal policies regarding 'post-materialist issues' such as lesbian/gay rights, euthanasia and environmentalism. Similar views are typically held by authors who see educational credentials as the primary source of new class differentiation.

Other new class theorists have concentrated on the nature of the employment relations that arise in post-industrial societies and which traditionally form the primary theoretical basis of the linkage between occupation and social class. Esping-Andersen (1993) claims that managers within the middle class "reflect a fordist logic of the division of labour", whereas the professionals within the middle class reveal the post-fordist logic of the division of labor (Esping-Andersen, 1993, p. 13). Consequently, he (1993, p. 24) delineates the class cleavages of the (post) industrial societies along two hierarchies, "broadly reflecting the degree of authority, responsibility" versus "level of human capital applied" to work tasks in different sectors. Note that the equivalent of Wright's (1985) "organizational assets" enter here as "responsibility and authority" and provide a way to define the 'old' middle class. Goldthorpe (2000) justifies his class schema on the basis of two similar dimensions: controllability of the work tasks and human capital needed to perform these tasks. Although Esping-Andersen (1993) had criticized Goldthorpe's class schema because it would not reflect the post-industrial class cleavages, both authors base their class distinctions on employment relations and end up with similar conceptions.

These views echo Kriesi's (1989a,b) earlier use of a 'new class' concept to explain support for social movements. This author locates the major middle class divide between "technocrats" and "social and cultural specialists", alluding to a distinction that is implicit in Esping-Andersen's and Goldthorpe's later discussion of the logics of post-industrial production. Kriesi (1989a, p. 1081) asserts that there exists "a basic antagonism of interest" between technocrats and social and cultural specialists. Technocrats are supposed to preserve the integrity of the organization they work for, while social and cultural specialists are more client-oriented and act within the body of knowledge of their discipline. Social and cultural specialists are supposed to constitute a 'new class' and they are likely to support new social movements because "the specialists try to defend their own and their clients' relative autonomy" against the interventions of the technocratic controllers (Kriesi, 1989a, pp. 1085–1086).

Bourdieu (1984) makes a distinction between an economic and a cultural status hierarchy and uses occupations to measure people's positions on these. His model effectively distinguishes two separate but correlated hierarchical dimensions to represent status differences among occupations. Occupations with low social status, such as unskilled workers, score low on both hierarchies, whereas some high-grade occupations score high on the cultural dimension, and other high-grade occupations score high on the economic dimension. The hierarchical status of occupations is primarily determined by the volume of resources required in a particular field of work. These resources themselves are divided into cultural resources (such as knowledge) and economic resources (such as managerial and organizational skills, but also inherited property). High-grade workers in education, health care and social services, in particular, are assumed to command cultural resources (Bourdieu, 1984, pp. 128–129) and would constitute the 'new class' of post-industrial societies. Occupations assumed to have relatively greater economic resources are those of the 'old' middle class, such as management, proprietorship, and other commercial and administrative occupations. Bourdieu (1984) then continues by showing pervasive distinctions between the two status hierarchies in the realms of taste, consumption and political orientation.

Whether interpreted as an opposition between the educated and the propertied classes (Brint, 1984), cultural and economic elites (Bourdieu, 1984), professionals and managers (Wright, 1997; Hout et al., 1995), controllers and human-capital workers (Goldthorpe, 2000), technocrats and social and cultural specialists (Kriesi, 1989a,b), all of these distinctions imply similar cleavages within the middle class. Bell's (1973) post-industrial society, Bourdieu's (1984) cultural and economic cap-

ital, and Esping-Andersen's (1993) fordist and post-fordist production-logics all indicate that next to the economic basis of social classes, social-cultural capital and skills have become essential classification devices in employment relations and in class structure alike.

The particular new class conception we examine in this study primarily builds upon Kriesi's distinction between technocrats and social and cultural specialists, which we believe is the conceptually best-developed idea in the new class literature, since it specifies operational criteria to measure the distinctions. Kriesi's separation of the middle-class fractions has been formally operationalized by Güveli (2006) and has been validated in research by Güveli et al. (2007a,b). Inspired by Kriesi (1989a,b), Güveli (2006) conceives the two fractions as distinct on the basis of a combination of two criteria. First, social and cultural specialists provide services to members of society through care, education, science, arts or social work. Second, employers struggle to control social and cultural specialists, because their performance is based on expert knowledge and skills that cannot be acquired or monitored by others without long preparation. Social and cultural specialists meet these two criteria at the same time. Conversely, technocrats are defined as occupying middle-class positions in other sectors (mainly government, commercial services, agricultural and industrial production), *or* middle-class positions in social and cultural sectors that primarily perform supervisory or managerial duties.

1.2. Research problems and research site

Most authors involved in the new class debate validate the distinctions they make using the different positions of the classes on outcome dimensions, such as political or moral orientations, or taste and consumption styles. As a more direct validation, we ask to what extent different fractions of the middle class have established characteristic patterns of intergenerational reproduction and exclusion, and thus effectively constitute social classes in their own right with a stable demographic identity. We answer this general question using Güveli's (2006) measurement procedure to separate the EGP classes I and II (Erikson et al., 1979) into four fractions: An 'old' class of (Ia) high-grade technocrats and a 'new' class of (Ib) high-grade social and cultural specialists; and an 'old' class of (IIa) low-grade technocrats and a 'new' class of (IIb) low-grade social and cultural specialists.

We examine whether these 'old' and the 'new' classes are indeed differentiated with regard to their intergenerational mobility patterns by using *external* and *internal homogeneity* criteria. Starting off from Weber's *dictum*, Breiger (1981) was the first to propose homogeneity of association to decide on the collapsibility of two or more categories in a class mobility table. According to Goodman (1981), two categories in a cross-tabulation can only be said to be collapsible, when both external and internal homogeneity exist. External homogeneity, also referred to as 'structural equivalence' in network models (Breiger and Mohr, 2004), exists when two categories are statistically independent with respect to *other* categories in the table. Internal homogeneity exists when the 2×2 table between the two categories shows statistical independence.

Applied to two categories in a social mobility table, internal hetero/homogeneity refers to mutual exchanges between two classes, whereas external hetero/homogeneity refers to their inflow from and outflow to other class categories. Our general question about the intergenerational mobility patterns of the newly distinguished classes can be split into two sub-questions. The first concerns the external mobility patterns of the assumed classes:

1. *To what extent are (high- and low-grade) technocrats and (high- and low-grade) social and cultural specialists externally heterogeneous, i.e. have distinct inflow from and outflow to other social classes?*

Internal homogeneity entails perfect mutual exchanges among the disaggregated classes. Only if the new and old classes also create distinct boundaries in these mutual exchanges, is the hypothesis of a differentiated middle class fully confirmed. Our second question thus reads:

2. *To what extent are (high- and low-grade) technocrats and (high- and low-grade) social and cultural specialists internally heterogeneous i.e. independent with respect to their mutual exchanges?*

Our research site, the Netherlands between 1970 and 2006, can aptly be interpreted as an advanced post-industrial society, as it has experienced a substantial shift in employment from agriculture and industry into the service sector. For example, between 1960 and 1994 (the period in which our respondents typically made their occupational choices) the share of industrial employment fell from 33% to 18%, while employment in the commercial service sector increased from 21% to 30% and employment in other service sectors rose from 19% to 34% (Asselberghs et al., 1998, p. 5). In the same period, the country developed one of the world's most extensive welfare systems (Cox, 1993). As a result, the number of people employed in the public sector expanded enormously: from 19% in 1960 to 35% in 1994 (Asselberghs et al., 1998, p. 10). The growth of the public sector is particularly relevant for the differentiation of the middle class, because many social and cultural specialists are employed in the public sector. In brief, if one wanted to identify a country best fit to test the consequences of the coming of post-industrial society, the Netherlands would be a perfect choice.

The Dutch class structure has experienced changes parallel to its employment structure. The proportion of men in the middle class (operationally defined as EGP I/II) increased from 31% in 1970 to 50% in 1999 (Ganzeboom and Luijkx, 2004b), implying that today the majority of the employed Dutch population is part of the middle class. Conversely, the proportion of men in the classes of semi-skilled, unskilled and agricultural workers decreased from 40% in 1970 to 32% in

1999. For women, this development is even more pronounced. Their labor market participation rose from 25% to 54% between 1971 and 2002 (SCP, 2006; CBS, 2007). Their share in EGP I/II increased disproportionally, at the expense of women in (semi-skilled and unskilled) manual work (Ganzeboom and Luijkx, 2004a). Thus, the Netherlands is a prime example of the rise of middle classes, old or new. This creates another motivation for our analysis: when the middle classes (i.e. class I and II in the EGP class schema) account for half of the economically active population, as is the case in the Netherlands, the middle/working class distinction becomes less useful and it is necessary to consider whether there are meaningful internal divisions within the middle classes.

Finally, the historical dimension of our dataset allows us to assess the claims implicit in new class theories that inequalities within the middle class are on the rise in the post-industrial world:

3. *To what extent have the social and cultural specialists and technocrats developed a more distinct external and internal mobility patterns over time?*

2. Expectations

Most of the new class theorists (Bell, 1973; Brint, 1984; Kriesi, 1989a; Esping-Andersen, 1993) have not focused on social mobility patterns of the 'new' classes, let alone provided a theoretical account of those patterns. However, we can draw upon the class reproduction theory of Bourdieu (1984, pp. 20, 230–232), whose ideas on economic and cultural elite formation provide a logic with which to derive expectations about changes in new class reproduction more generally. Following Bourdieu, one can argue that differences in social mobility and reproduction between the 'new' classes derive from the different kinds of resources they command. Social reproduction processes take place in the context of fields such as science, education, the arts, commercial services and governance, which require specific resources in order to be successful. Social agents in any given field occupy positions, or try to create new ones, by controlling and exploiting the resources specific to the occupational roles they perform in this field. Bourdieu (1984, Chapter 5) claims that the cultural elite has more intellectual, creative and communication skills than the economic elite. Social and cultural specialists distinguish themselves from other occupational categories within the middle class, being most prevalent in the fields in which cultural skills and forms are in high demand and highly valued: care, education, science and the arts. By contrast, technocrats more often command greater economic resources, such as organizational, commercial and managerial skills (Savage et al., 1992), which are in high demand in the fields that they dominate: governance, commercial services and industrial and agricultural production (Goyette and Muller, 2006).

Bourdieu (1984, p. 12), Bourdieu and Passeron (1977, pp. 13–14) and Bourdieu (1990, pp. 144–146) then argues that class-specific reproduction patterns can best be understood with reference to the skills that are specific to a class. Cultural resources are easier to store in families than economic resources because the former are a set of internalized dispositions (''habitus'') that govern people's behavior (Bourdieu, 1984, pp. 20, 230–232). Bourdieu (1984, pp. 80–85) also claims that it is relatively easy to pass on cultural skills and assets to offspring, whereas transmitting commercial and organizational skills and assets to them is relatively difficult. Savage et al. (1992) add to this argument that organizational skills are difficult to store in families because of their context-specific nature. ''Those with organizational assets often have to transform them into cultural assets or property assets in order to store them and hence transmit them. This dynamic is the central feature of middle-class formation, and the way in which this evolves in any particular society will lay the foundation for patterns of middle-class formation'' (Savage et al., 1992, p. 17). Bourdieu (1984, pp. 80–85) also points to the pivotal role that formal education plays in social reproduction. Social reproduction is stronger in educational attainment than in occupational attainment. As social and cultural specialists (much like Bourdieu's cultural elite) are often more highly educated than their middle class counterparts, one would expect the social and cultural specialists to show more closure as a social class, and increasingly so, as the role of education has become more important in post-industrial societies.

2.1. External heterogeneity

Our expectations about the external heterogeneity of the middle-class fractions can be deduced from Bourdieu's model of economic and cultural differentiation. If the new class theories hold, we would expect that the disaggregated middle-class fractions each have their own inflow and outflow patterns and are therefore not collapsible with one another in this respect. More specifically, we expect that men and women with lower-status origins are particularly barred from mobility into the social and cultural specialist fractions, due to the strict educational requirements for these positions. By contrast, educational credentials less exclusively dominate access to technocratic positions and these positions allow for more opportunities for entry during the (later) occupational career. Our first hypothesis therefore states that *there is more inflow to the technocratic fractions from the lower social classes than to the social and cultural specialists fractions*. On the other hand, we expect *the offspring of the social and cultural specialists to be more resistant to downward mobility than their counterparts with technocratic origins*.

2.2. Internal heterogeneity

If the two middle-class fractions would constitute one single class, intergenerational mobility among them would be 'perfect'. That is, origin fraction would not matter for the odds of entering one fraction or the other, provided someone is destined

to stay in the middle class to begin with. However, we would still expect actual mobility patterns to diverge from perfect mobility by showing class-specific immobility, which is driven by occupation-specific transfer of resources (Weeden and Grusky, 2005). Both fractions can be expected to command such resources: these may involve the intergenerational transfer of occupation-specific knowledge, social contacts, aspirations, or the transfer of property. Setting this aside, we still expect that intergenerational immobility is easier to maintain for the social and cultural specialists than for the technocrats, as the required resources are easier to store and reproduce within families. Therefore, our second hypothesis reads: *the social and cultural specialists are intergenerationally more immobile than the technocrats.*

2.3. Inheritance of class position over time

If a social class is a *new* class we can assume that it needs time to crystallise. Goldthorpe (1982, p. 181) argues that a social class goes through a process of organizing its class interests. The "classes acquire a demographic identity – that is, become identifiable as collectivities through the continuity with which individuals and families retain their class positions over time" (Goldthorpe, 1982, pp. 171–172). Only when this process has been completed, do the members of a class act in accordance with their class interests. Over time, we would therefore expect an increase in inheritance of class position for new classes of social and cultural specialists, as well as a more a declining amount of exchanges with other classes. However, the Netherlands, even more than other advanced societies (Breen and Luijkx, 2004), has been experiencing a clear general trend towards more social fluidity and less social reproduction. This general trend does not necessarily rule out that the 'new' classes of the high- and low-grade social and cultural specialists have been able to increase their capacities to reproduce their social positions. Our third hypothesis specifically holds that *over time the social and cultural specialists have become more intergenerationally immobile than the technocrats, but only relative to the over-all trend towards higher social mobility and more social fluidity that we know to exist in the Netherlands.*

3. Measurement, data and methods

3.1. Distinguishing technocrats and social and cultural specialists

The EGP class schema has become the *de facto* standard indicator of class positions in intergenerational mobility research (Erikson et al., 1979; Ganzeboom et al., 1989; Erikson and Goldthorpe, 1992; Breen, 2004). Güveli (2006) used this class schema as point of departure and distinguished the four fractions by differentiating the middle classes EGP-I and EGP-II. Previous authors have almost exclusively relied on *fiat* measurement. Moreover, none of them have documented their class and occupational distinctions in any detailed and tractable way. By contrast, in order to develop a valid and reliable categorization, Güveli (2006) asked 12 labor market experts to allocate all occupations in EGP classes I and II to a class of technocrats or a class of social and cultural specialists. The experts were presented with detailed descriptions of 293 middle-class occupations that were derived from the Standard Classification of Occupations 1984 [SBC-84] of Statistics Netherlands, as well as with the criteria used by Güveli (Güveli et al., 2007a; Güveli, 2006, p. 31) to define social and cultural specialists versus technocrats. These criteria can be summarized as follows: occupations are to be classified as social and cultural specialists if the tasks are relatively difficult to monitor by employers and if the basic tasks consist of social services and/or are based on specialized knowledge in social and cultural issues; occupations are to be allocated into the fraction of technocrats, if their tasks are relatively easy to monitor by their employer or if the basic tasks in these occupations consist of controlling employees. An occupation was to receive a score of 1 when an expert allocated this occupation into the class of technocrats and a score of 2 when the expert allocated this occupation into the class of social and cultural specialists. There was strong agreement among the experts about the allocation of occupations in one class or the other: the KR20 reliability coefficient (alpha coefficient for dichotomous items) is higher than 0.946; no expert disagreed strongly with the others and overall reliability could not be improved by leaving out experts. Then the mean expert allocation score was calculated for each occupation. For 45% of the occupations there was perfect agreement among the experts. Occupations with scores below 1.3 and above 1.7 (77% of the total) were simply allocated to the nearest category. The remaining occupations (23% of the total) about which the experts were more in disagreement, were allocated by Güveli in consultation with some of the experts. Fig. 1 shows the classes within the adjusted EGP class schema with typical occupational categories belonging to these classes. The full classification and conversion tools are documented in Güveli (2006) and available online (www.ayseguveli.nl).

3.2. Data

Our 47 nationally representative random sample surveys have been collected in the Netherlands between 1970 and 2006 and include detailed father-to-son and father-to-daughter-mobility flows among 32,965 men and 28,013 women.[1] The data have been harmonized and produced as part of the International Stratification and Mobility File (ISMF). The sources of these surveys are listed in Appendix A – Table A1. From the ISMF, we selected all files on the Netherlands that contain detailed occupation codes, as well as sufficient information on self-employment and supervisory status, both of which are needed to create

[1] This is a weighted sample size that applies throughout our analysis. See Appendix A – Table A1 about the particular weights applied.

EGP	Adjusted EGP	Class name	Occupations
I	Ia	High-grade technocrats	Managers of large firms, governmental and non-governmental administrators, physical scientists, etc.
	Ib	High-grade social and cultural specialists	Medical doctors, dentists, university teachers, social scientists, high church officers etc.
II	IIa	Low-grade technocrats	Managers of small firms, engineers, computer programmers, accountants, etc.
	IIb	Low-grade social and cultural specialists	Medical assistants, professional nurses, teachers, journalists, artists, etc.
IIIa	IIIa	Routine non-manual workers	Routine clerical employees in administration and commerce, rank and file service workers
IIIb	IIIb	Sales and personal service workers	Sales and personal service workers
IVa	IVa	Small employers	Small proprietors with employees
IVb	IVb	Own-account workers	Small proprietors without employees
V	V	Manual supervisors	Lower-grade technicians, supervisors of manual workers
VI	VI	Skilled manual workers	Skilled manual workers
VIIa	VIIa	Semi- and unskilled workers	Semi- and unskilled manual workers
VIIb	VIIb	Farm labourers	Farm labourers
IVc	IVc	Self-employed farmers	Self-employed farmers

Fig. 1. EGP and adjusted EGP class schema, class name and some examples of occupational groups.

the initial EGP categories for fathers and respondents. The data are derived from a diversity of sources, and cover all major surveys available on the country, including national election studies, demographic surveys, and major international projects such as ISSP, ISJP and ESS. To a considerable extent, our data overlap with the data examined by Breen and Luijkx (2004), who tested the quality of the surveys explicitly and found no flaws (Breen and Luijkx, 2004, pp. 403–405).

The data originally contained a variety of detailed occupation codes: while a majority of the data have been categorized according to the 1971/1984 standard occupational classification [SBC-84] of Statistics Netherlands, both older and newer Dutch classifications have been used, and, in a number of international files, occupational measures have been based on either the 1968 or 1988 version of the International Standard Classification of Occupations [ISCO-68, ISCO-88]. In the ISMF, all files have been internationally harmonized employing both the 1968 and 1988 version of ISCO, and conversions of both codes into the EGP class categories are available (Ganzeboom and Treiman, 2003). In order to diverge as little as possible from the Güveli (2006) measurement procedure, we have constructed the adjusted class categories in two ways. For all the data files in which occupations were measured using the SBC-84 occupation code, we constructed the categories using its close relative,[2] ISCO-68, as the conversion tool. For the remaining files, we used the ISCO-88 classification as our conversion tool. We have experimented with exchanging and combining the two different conversion tools, but have not found any systematic divergence between them.

Only respondents aged between 25 and 64 years old are included in the analysis. Respondents' class is typically identified on the basis of their current or last occupation. The class of respondents' father is usually identified on the basis of the occupation the father had when the respondent was around 15 years old.

We distinguish seven periods to make over-time comparisons: (1) 1970–1974; (2) 1975–1979; (3) 1980–1984; (4) 1985–1989; (5) 1990–1994; (6) 1995–1999 and (7) 2000–2006. Table 1a and 1b display the relative frequencies of the class categories in the seven periods for women and men respectively. Table 1a shows that the share of men in the class of high-grade technocrats increased from 13% to 19% while the percentage of men in the class of low-grade technocrats increased from 11% to 19%. Table 1b shows that women were under-represented in technocratic occupations in early periods but that the proportion of women in these occupations has increased gradually over time. The share of women in the class of the high-grade technocrats rose from 4% in 1970 to 7% in 2006, while it increased at an even more dramatic rate in the class of low-grade technocrats, from 3% to 12%.

Men's representation (Table 1a) in the class of high-grade social and cultural specialists remained stable between 1970 and 2006 (around 2.5%) whereas the percentage of men in the class of low-grade social and cultural specialists has more than doubled, from 6% to 12%. Table 1b shows that the percentage of women in the class of high-grade social and cultural specialists has increased from 1% in 1970 to 4% in 2006. Women are relatively over-represented in the class of low-grade social and cultural specialists in the beginning of the period but this proportion increased only slowly, from 17% to 21%, between 1970 and 2006. In sum, it is clear that more and more Dutch workers have become employed in middle-class occupations. However, it is not so clear that the share of the 'new' class of social and cultural specialists has been rising disproportionately. In fact, for both men and women, the increase in the share of social and cultural specialists has been slower than the share of technocrats.

[2] ISCO-68 and SBC-84 have a one-to-one correspondence at the three-digit level.

Table 1a
Class structure for men in the labor force for seven 5-years periods, Netherlands 1970–2006.

	1970–1974	1975–1979	1980–1984	1985–1989	1990–1994	1995–1999	2000–2006	Total
Ia. High-grade technocrats	13.0	11.9	11.4	11.7	12.8	16.9	18.6	15.0
Ib. High-grade social and cultural specialists	2.5	1.5	2.1	2.1	1.9	2.4	2.6	2.2
IIa. Low-grade technocrats	10.6	12.3	11.3	11.7	17.7	19.5	19.3	16.5
IIb. Low-grade social and cultural specialists	5.6	9.2	10.6	10.0	11.6	10.5	11.9	10.6
IIIa. Routine non-manual	9.5	12.1	12.2	13.5	11.8	9.9	9.0	10.8
IIIb. Sales and personal service workers	3.6	4.5	4.9	6.7	4.1	3.5	3.7	4.2
IVa. Self-employed with employees	4.1	2.6	1.6	2.8	2.1	1.3	1.9	2.0
IVb. Self-employed without employees	4.9	2.9	2.1	3.0	1.4	1.5	1.4	2.0
V. Manual supervisors	2.2	3.7	4.0	3.1	3.5	4.9	3.9	3.9
VI. Skilled manual workers	19.3	20.2	21.0	17.4	15.6	13.2	12.1	15.3
VIIa. Unskilled manual workers	16.5	12.0	13.6	13.6	13.3	13.1	12.4	13.2
VIIb. Farm laborers	2.2	2.2	1.8	1.2	1.2	1.1	1.0	1.3
IVc. Farmers	6.0	5.1	3.5	3.0	3.0	2.2	2.2	3.0
Total *N*	1787	3008	2368	4003	5140	9050	7609	32,965

Table 1b
Class structure for women in the labor force for seven 5-years periods, Netherlands 1970–2006.

	1970–1974	1975–1979	1980–1984	1985–1989	1990–1994	1995–1999	2000–2006	Total
Ia. High-grade technocrats	3.9	1.7	0.9	1.6	3.0	5.0	6.7	4.4
Ib. High-grade social and cultural specialists	1.2	1.0	0.7	1.1	1.9	2.7	3.5	2.4
IIa. Low-grade technocrats	2.6	4.1	4.3	5.2	7.1	12.9	11.7	9.7
IIb. Low-grade social and cultural specialists	16.5	18.1	14.4	16.6	20.6	17.3	20.7	18.6
IIIa. Routine non-manual	24.2	22.9	24.5	25.1	27.4	23.2	22.1	23.8
IIIb. Sales and personal service workers	14.9	15.8	16.8	19.1	13.1	17.7	13.0	15.5
IVa. Self-employed with employees	3.3	0.8	0.5	1.7	1.1	0.6	0.9	0.9
IVb. Self-employed without employees	5.1	3.0	2.3	3.7	1.6	1.5	2.0	2.1
V. Manual supervisors	0.2	1.0	0.4	0.5	0.2	0.5	0.4	0.4
VI. Skilled manual workers	5.1	3.5	4.6	3.2	3.8	2.5	2.8	3.1
VIIa. Unskilled manual workers	20.8	25.6	29.6	20.7	18.6	15.0	14.8	17.6
VIIb. Farm laborers	1.1	1.3	0.3	0.7	1.2	0.7	0.8	0.8
IVc. Farmers	1.2	1.2	0.6	0.9	0.5	0.6	0.5	0.6
Total *N*	571	1019	2054	2858	4355	8439	8717	28,013

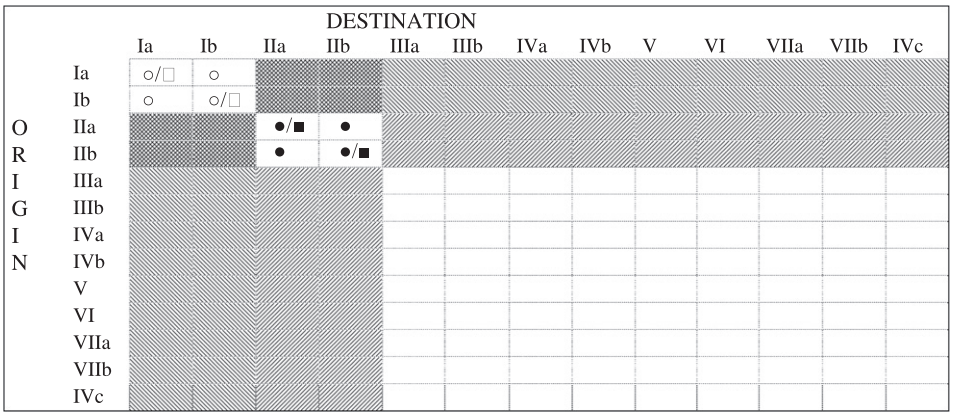
3.3. Method

Appendix A – Tables A2 and A3 show the patterns of outflow from origin class to destination class for men and women for all datasets and periods together.[3] These tables constitute the basic material for the statistical analysis reported below. Our task is to develop models for the association patterns in these tables. We need to determine whether the technocrats and the social and cultural specialists have characteristic mobility patterns and how these patterns can be efficiently represented. As mentioned before, we use *external* and *internal homogeneity/heterogeneity* criteria for doing this. By means of these criteria, we effectively test whether these categories are collapsible or should remain disaggregated (Goodman, 1981). We show in Fig. 2 the homogeneity/heterogeneity criteria as applied in our analysis (cfr. Goodman (1981) for similar displays).

The condition of external homogeneity applies to the cells that represent mobility between, on the one hand, the classes considered for dis/aggregation and, on the other hand, all the other categories in the table. The cells relevant to the external homogeneity criterion for collapsing, *the high-grade technocrats* (Ia) and *the high-grade social and cultural specialists* (Ib), are shaded with diagonal lines. The cells relevant to the external homogeneity criterion for collapsing *the low-grade technocrats* (IIa) and *the low-grade social and cultural specialists* (IIb) are shaded in reversed diagonal lines. The condition of external homogeneity means that the respective two classes have identical inflow to and outflow from the other classes and this implies that statistical independence exists in this part of the table. If the hypothesis of external homogeneity is rejected, the relevant classes are said to be externally heterogeneous.

The condition of internal homogeneity versus heterogeneity pertains to the cells that represent mobility among the classes that are considered for collapsing. In the case of the class of high-grade technocrats and the class of the high-grade social

[3] The detailed counts that are used in our analyses are available from the first author upon request.



- When there is independence in the area shaded with diagonal lines, external homogeneity for classes Ia and Ib applies;
- When there is independence in the area shaded with reversed diagonal lines, external homogeneity for classes IIa and IIb applies;
- When there is independence in the cells with ○, the strong version of internal homogeneity for classes Ia and Ib applies;
- When there is independence in the cells with ●, the strong version of internal homogeneity for classes IIa and IIb applies;
- When there is independence in the off-diagonal cells with ○ and equal immobility in the cells with □, the weak form of internal homogeneity for classes Ia and Ib applies;
- When there is independence in the off-diagonal cells with ● and equal immobility in the cells with ■, the weak form of internal homogeneity for classes IIa and IIb applies;

Fig. 2. Overview of the heterogeneity/homogeneity criteria for classes Ia, Ib, IIa and IIb in a 13-by-13-mobility table.

and cultural specialists this means that there is statistical independence in the cells marked "○" in Fig. 2 and that mobility between them is 'perfect'. Internal homogeneity for the class of low-grade technocrats and the class of low-grade social and cultural specialists stands for perfect mobility between these two classes – these cells are marked "●" in Fig. 2. If the condition of local independence is rejected, the relevant classes are said to be internally heterogeneous.

It is possible that external heterogeneity applies while internal heterogeneity does not, and *vice versa*. Furthermore, the reader will note that we can test the internal and external homogeneity of classes Ia and Ib as well as for classes IIa and IIb simultaneously. We then fit the model of independence on the shaded area plus the cells marked "○" and "●" in Fig. 2.

Our tests of heterogeneity are based on scaled uniform association models, which were developed by Goodman (1979) and Hauser (1984a,b). Luijkx (1994) shows how these models can test for local independence by using equality constraints on the scaling parameters and are thus equivalent to the tests of collapsibility used by Goodman (1981). The starting point of the scaled association model is the uniform association model that assumes all contiguous (log) odds ratios in a table are identical:

$$\ln \theta_{ij} = \varphi \tag{1}$$

The uniform association model uses a single degree of freedom to characterize all odds ratios in a table, which is a highly parsimonious but often a too-restrictive assumption to fit the data. This stringent assumption can be meaningfully modified in three ways:

(1) By scaling the distances between the row (μ_i) and column (ν_j) categories:

$$\ln \theta_{ij} = \varphi(\mu_{i+1} - \mu_i)(\nu_{j+1} - \nu_j) \tag{2}$$

where μ_i and ν_j are scaling parameters, subject to the constraints of mean 0 and variance 1, while φ is the scaled uniform association parameter that describes the association throughout the table, conditional upon the scaling parameters.

(2) As a useful special restriction in the scaled model we can introduce equal scaling parameters for rows and columns:

$$\mu_i = \nu_i \tag{3}$$

i.e., rows and columns are identically scaled. This does not only lead to a more parsimonious model, but has the useful sociological interpretation that row and columns (origins and destinations) constitute the same hierarchy with respect to mobility chances.

(3) By excluding diagonal cells from the association pattern through fitting distinct diagonal parameters δ_{iik}. Excluding diagonal cells (and separately modelling them) parallels the assumption that staying in father's class (i.e., class inheritance) is not necessarily governed by the same contingencies as the pattern of mobility for the mobile. The diagonal density parameters δ_{iik} represent within-class immobility over and above the immobility uniformly inherent to all categories.

Taken together, these three specifications constitute the Quasi Equal Row and Column II (QERC-II) model, or the Goodman/Hauser model, named after its principal inventors (Goodman, 1979; Hauser, 1984a,b). The model uses a limited number of degrees of freedom to characterize the pattern of association within tables. In our $13 * 13$ tables, the 144 elementary odds ratios are summarized by 13^4 scaling parameters (equal for row and columns), one over-all scaled uniform association parameter, and thirteen diagonal cell parameters.

Scaled association models are very powerful tools, not only to characterize a mobility pattern, but also to investigate over-time developments, because they allow us to concentrate between-table differences in a few parameters. Using over-time constraints can strengthen this. We will constrain μ_i and ν_j to be the same for tables from different periods. We will then assemble over-time differences in a single diagonal density parameter (δ_{ii}) and in the scaled association parameter (φ_k) by using over-time constraints. Regarding the diagonal effects δ_{iik}, we assume that the development over time is the same for each diagonal cell i, but that the density per cell i varies such as:

$$\begin{aligned}\delta_{iik} &= \delta_{ii} * \beta_k \\ \delta_{iik} &= \delta_{ii} * (1 + \beta Y) \\ \delta_{iik} &= \delta_{ii} * (1 + \beta Y + \gamma Y^2)\end{aligned} \tag{4}$$

for respectively a (uniform) trendless, a linear and a curvilinear development of the diagonal densities.

3.3.1. Strong and weak versions of the internal homogeneity criterion

The QERC-II model contains parameters that separately model the diagonal densities. These diagonal coefficients represent immobility in classes over and above the density for the diagonals implied by the scaled association parameters. The condition of internal homogeneity can fit without such class-specific diagonal coefficients. The condition of internal homogeneity thus understood is the *strong* version. However, it is likely that this criterion does not fully apply. In this case, we can weaken the internal homogeneity criterion by including selected parameters of class inheritance in the model. The relevant cells are marked "□" and "■" in Fig. 2. This then is the *weak* version of internal homogeneity.

Fig. 2 shows the application of internal and external homogeneity conditions for collapsing classes Ia and Ib into one class and for collapsing classes IIa and IIb into another. Note, however, that another option would be to examine the higher–lower boundary; that is, to collapse the classes Ia and IIa into one class and to collapse classes Ib and IIb into another class. Again, we would conclude that these classes could be collapsed, if both the external and internal homogeneity conditions apply.

4. Results

To test whether the internal and external homogeneity criteria are met or heterogeneity prevails, we compare a range of log-linear models in Table 2. Column 1 shows the model specification and Column 3 presents the fit measures (L^2) of the estimated models for men, while Column 5 does so for women. Column 2 shows the degrees of freedoms (df) of these models for both men and women. Columns 4 and 6 show the *Bayesian Information Coefficient* (BIC), calculated as $L^2 - \mathrm{df} * \ln(N)$. The BIC score (Raftery, 1986) is an appropriate device with which to compare models when one has large sample sizes, which applies here, and will be our main guidance. While even substantively negligible margins of misfit will produce significant L^2 values, BIC will appropriately correct for sample size. Models with more negative BIC are to be preferred. Thus we use BIC to find the best fitting model, while the L^2 statistics only serve to assure the statistical significance of the difference between models. Our models are estimated in LEM (Vermunt, 1997), but we have re-estimated some of the models in SPSS GENLOG to re-express the estimated parameters into a standardized metric.

4.1. Baseline models and class inheritance

Panel A of Table 2 shows the baseline models. We start model selection with the independence (Model A0) and the quasi-independence (Model A1) models to see whether there is any (off-diagonal) association between the classes of origin and destination. Model A0 tests the null-hypothesis that there is no association at all, while Model A1 implies that association only occurs on the main diagonal. Both models have a very poor fit and the BIC statistics are positive, so there is considerable association between the classes of origin and destination, also outside the diagonal.

Model A2 of Table 2 is the equal row and column model II [ERC-II]. It allows for 13 scaling parameters ($\mu = \nu$) and one association parameter φ to model the association between origin and destination, for diagonal and off-diagonal cells at the same time. Model A3 is the Quasi Equal Row and Column model II (QERC-II), *i.e.* the diagonal cells are excluded from the estimation of the scaled association parameters.[5] Previous research has found that the QERC-II model is the best model for revealing patterns in an intergenerational mobility table (Hout, 1983). This is also true for our data: note that for both men and women, its BIC is the lowest throughout the table. This remains true when in Model A4 we relax the equality con-

[4] Note that these 13 parameters consume only 11° of freedom, due to the restrictions used in standardization.

[5] These diagonal densities by themselves do not contain information relevant to the distances between the categories, but the fit of the diagonal densities contributes to the overall model-fit and lack-of-fit may influence the estimated $\mu_i = \nu_j$ parameters.

Table 2
Log-linear models for homogeneity of the middle class fractions for men and women between 25 and 64 years old ([N_{men} = 32,965] [N_{women} = 28,013]).

1	2	3	4	5	6
		Men		Women	
	df	L^2	BIC	L^2	BIC
Panel A: Baseline models (N)			(32,965)		(28,013)
A0. Independence model	144	7599.3	6101.2	3580.0	2105.4
A1. Quasi-independence model	131	2990.1	1627.3	2466.4	1124.9
A2. Equal Row and Column Model II	132	2843.4	1470.2	730.4	−621.3
A3. Quasi-equal Row and Column Model II	119	768.6	−469.4	416.2	−802.4
A4. Quasi Row and Column Model II	108	671.9	−451.6	393.5	−712.5
Panel B: External heterogeneity (N)			(27,101)		(23,580)
B1. A3 + without diagonal cells Ia, Ib, IIa and IIb	107	722.4	−369.8	389.2	−688.1
B2. B1 + Identical scaling for Ia and Ib, for IIa and IIb	109	740.6	−372.0	421.6	−675.8
B3. B1 + Identical scaling for Ia and IIa, for Ib and IIb	109	724.7	−387.9	415.0	−682.4
B4. B1 + Identical scaling for Ia, Ib, IIa and IIb	110	740.8	−382.0	425.4	−682.1
Panel C: Internal heterogeneity (N)			(5864)		(4433)
C1. Independence	9	260.3	182.2	97.0	21.4
C2. Quasi independence	5	15.5	−27.9	12.7	−29.3
C3. Quasi-independence + scaling	3	2.3	−23.8	4.6	−20.6
C4. C3 + Identical scaling for Ia and IIa, for Ib and IIb	4	11.2	−23.5	6.7	−26.9
C5. C4 + ... (strong version)	6	110.9	58.8	49.5	−0.9
C6. C3 + Identical scaling for Ia and Ib, for IIa and IIb	4	12.8	−22.0	12.6	−20.9
C7. C6 + ... (strong version)	6	187.2	135.1	72.9	22.5
Panel D: Internal plus external heterogeneity (N)			(32,965)		(28,012)
D1. A3 + Identical scaling for Ia and Ib, for IIa and IIb (weak version)	121	834.8	−424.0	530.1	−709.0
D2. D1 + Ia and Ib, IIa and IIb are independent from each other (strong version)	123	1014.2	−265.4	601.3	−658.3
D3. A3 + Identical scaling for Ia and IIa, for Ib and IIb (weak version)	121	832.1	−426.7	511.7	−727.4
D4. D3 + Ia and IIa, Ib and IIb are independent from each other (strong version)	123	900.3	−379.3	571.3	−688.3

straint on row and columns: the comparison means that father's and offspring's scaling can be regarded as identical, and express a single underlying social hierarchy.

Fig. 3 presents the scalings estimated in Model A3 for men and women separately, in their standardized format. For both men and women, the maximum distance among the classes is between the agricultural workers (VIIb) and the high-grade social and cultural specialists (Ib). The values imply that for both men and women, it is more difficult to enter the classes of the high- and low-grade social and cultural specialists (Ib and IIb) than the classes of the high- and low-grade technocrats (Ia and IIa). The symmetry of the model implies that the same holds for outflow. Hence this finding confirms our first hypothesis that there is more inflow to the technocratic fractions from the lower social classes than to the social and cultural specialists fractions, and the technocrats are more likely to be downwardly mobile.

In Fig. 4, we compare the 13 inheritance parameters of Model A1 and Model A3. With these inheritance parameters, that measure the densities on the diagonal of the mobility table, we can test our second hypothesis, that the social and cultural specialists are inter-generationally more immobile than the technocrats. The differences between the two sets of parameters show what happens if we take the off-diagonal association into account. Fig. 4 shows that, under the assumption that there is no association between origin and destination outside the main diagonal (gray bars), both the male and female high- and low-grade social and cultural specialists (Ib and IIb) are more likely to inherit their fathers' class positions than the male and female high- and low-grade technocrats (Ia and IIa). These results, taken at face value, would support our second hypothesis.

If one takes the association outside the main diagonal into account (black bars), the class inheritance of men decreases a bit (except for the self-employed classes), but the relation between the high- and low-grade social and cultural specialists, on the one hand, and the high- and low-grade technocrats, on the other, remains the same as it was in Model A1. The differences in immobility coefficients between Ia and Ib, and between IIa and IIb are statistically significant (not shown). This again supports our second hypothesis. However, the picture is different for women, among whom the high-grade technocrats are more likely to be immobile than their social and cultural counterparts. In fact, the high-grade female technocrats (Ia) inherit their father's class position more often than their male counterparts do! This is an interesting finding, but it contradicts our hypothesis 2, which states that social and cultural specialists are more immobile than technocrats. By contrast, for women in low-grade middle class occupations, there is almost no difference in inheritance between technocrats and social and cultural specialists. If tested (not shown), the difference in inheritance between IIa and IIb is not significant. This also contradicts our second hypothesis. Finally, observe that for women in general the inheritance of class positions in Model A3 is much lower than in Model A1 (with the exception of the self-employed) and even becomes slightly negative for the high-grade social and cultural specialists: these women inherit their fathers' class position less frequently than we would expect given the scaling components of the model.

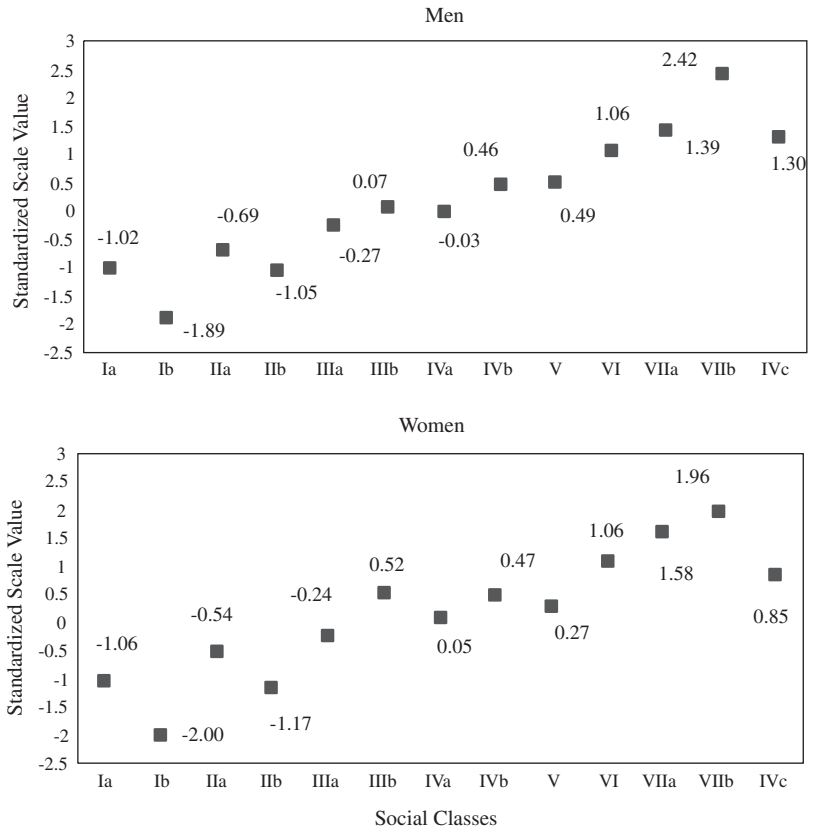


Fig. 3. Distance (scalings) between the social classes for men and women (Model A3 of Table 2).

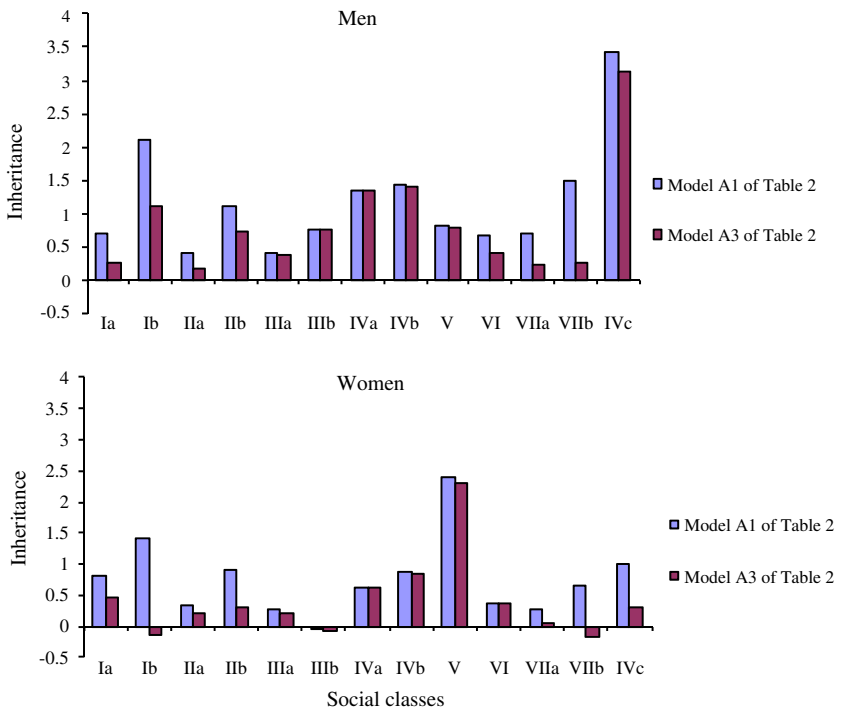


Fig. 4. Inheritance of class position of all social classes of Model A1 and A3 of Table 2 for men and women.

4.2. External heterogeneity of the assumed classes

Panel B of Table 2 examines the external heterogeneity of the assumed classes separately. The models in this panel test the null hypotheses that the relative mobility patterns between the four middle class fractions and the other classes are homogeneous. For models B, we have omitted all cells that constitute (im)mobility among and within the four middle-class fractions, in order to concentrate exclusively on the exchanges between the middle classes and the rest. Omitting these cells from Model A3 leads to Model B1, which is the baseline for examining external heterogeneity. In Model B2, we have equated the scaling parameter of the high-grade *technocrats* (I*a*) with the scaling parameter of the high-grade *social and cultural specialists* (I*b*). We have simultaneously equated the scaling parameter of the low-grade *technocrats* (II*a*) with the scaling parameter of the low-grade *social and cultural specialists* (II*b*). By contrast, in Model B3, we have equated the scaling parameter of the *high*-grade technocrats with that of the *low*-grade technocrats (*I*a and *II*a) and we have equated the scaling parameter of the *high*-grade social and cultural specialists with that of the *low*-grade social and cultural specialists (*I*b and *II*b). In Model B4, all four classes are constrained to have the same scaling, effectively making them externally homogeneous. Note that each constraint corresponds to the local independence tests for structure as proposed by Goodman (1981), but that in our methodology we use constrained parameters to implement the model. For men, the comparisons of the BIC scores of these four models show that B3 fits the data better than other models. This implies that both classes of technocrats exhibit external mobility patterns dissimilar from the social and cultural specialists, but that the high/low grade distinction does not matter. That is, disregarding the higher–lower distinction within the middle class fits the data better than disregarding the distinction between the horizontal fractions. While not anticipated, this finding clearly supports the new class thesis. For women, the BIC comparison favors the baseline Model B1, which implies that both the technocrat/social and cultural specialist and the high/low grade distinctions need to be maintained. Note, however, that also for women Model B3 is better than Model B2. For women as well, the new class boundaries are more pronounced than the hierarchical distinction. Altogether this supports the thesis of a new class differentiation.

4.3. Internal heterogeneity of the assumed classes

Models C1–C7 concentrate exclusively on mobility among the four middle-class fractions. The comparison of C1 and C2 repeats the earlier observation that there is significant inheritance within each of the four categories. Model C3 adds four scaling parameters for the off-diagonal association. This improves the model fit by classical criteria (the difference in L^2 is statistically significant), but not according to the BIC measure. Models C4 and C6 investigate the collapsibility of the classes over the status divide (*I*a = *I*b and *II*a = *II*b), respectively over the divide between technocrats and social-cultural specialists (I*a* = II*a* and I*b* = II*b*). This comparison leads to the same conclusion about the class hierarchy as for external mobility in panel B. We find that collapsing Ia and IIa, respectively Ib and IIb (*i.e.* collapsing over the status boundary, as in Model C4) would fit slightly better than collapsing the distinction between technocrats and social-cultural specialists, as in Model C6. However, while the quasi-independence Model C2 does not fit the data according to classical test criteria, it remains the best-fitting model in this panel according to BIC. This would suggest that internal heterogeneity criteria do not differentiate among the four middle-class fractions: once subjects are mobile in this internal mobility table, origins and destinations become indistinguishable. In Models C5 and C7, we estimate the strong versions of the models, in which classes are collapsed across the status boundary, respectively across the new class boundary. Both strong versions need to be rejected, implying that the class-specific densities are indeed strong within each of the four middle-class fractions, and that this does not generalize to the sub-diagonals.

All in all, the analysis of internal mobility leaves us with no simple conclusions. Whereas the best-fitting model according to BIC implies that there are essentially no boundaries for short-distance mobility other than class-specific inheritance, the models that fit best according to classical criteria (C3) imply such boundaries, both with respect to high/low grade and with respect to technocrats/social and cultural specialists boundary. In fact, the two respective parameters are statistically significant, although the significance for the status boundary for women is only marginally so (cfr. C3 and C4 for women).

4.4. Internal and external heterogeneity of the assumed classes combined

Models D1–D4 examine internal heterogeneity combined with external heterogeneity. These models test at the same time the null-hypothesis that there is perfect relative mobility among the fractions of the middle class and whether the mobility between these fractions and the other classes in society is homogeneous. In Model D1, the scaling parameter of the high-grade technocrats is equated with that of the high-grade social and cultural specialists (*I*a = *I*b) and the scaling parameter of the low-grade technocrats is equated with that of the low-grade social and cultural specialists (*II*a = *II*b). In other words, are the origins and destinations of classes Ia and Ib statistically independent? The same test is performed by Model D2. Model D1 assumes that there is direct inheritance of class position (weak version of internal homogeneity), while Model D2 does not (strong version). Model D2 significantly worsens the model fit according to L^2 and BIC scores. However, the important observation is that Model D1 fits considerably worse than Model A3. Hence, we can conclude that mobility between the origin and destination of the high-grade technocrats and the high-grade social and cultural specialists and the origin and destination of the low-grade technocrats and the low-grade social and cultural specialists is not homogeneous.

Table 3
Log-linear models of social reproduction and its over-time development for men and women between 25 and 64 years old in seven periods, 1970–2006 ([N_{men} = 32,965] [N_{women} = 28,012]).

1	2	3	4	5	6
		Men		Women	
	df	L^2	BIC	L^2	BIC
E1. Heterogeneous scalings, all class inheritance different by period	833	1565.6	−7100.3	1172.0	−7358.3
E2. Homogeneous scalings, all class inheritance different by period	899	1662.1	−7690.4	1282.0	−7924.2
E3. No change of class inheritance over periods	977	1799.7	−8364.2	1390.4	−8614.5
E4. General inheritance different by periods	971	1751.8	−8349.8	1378.5	−8564.9
E5. Linear constrained inheritance over periods, one slope	976	1764.2	−8389.3	1382.6	−8612.0
E6. Inheritance different by periods, three groups	956	1754.1	−8191.4	1366.3	−8423.5
E7. Linear constrained inheritance over periods, three slopes	974	1760.1	−8372.6	1382.5	−8591.7
E8. Linear constrained inheritance over periods, two slopes	975	1760.5	−8382.6	1382.6	−8601.9

Therefore, we cannot collapse technocrats and social and cultural specialists into a single class. This overall analysis also supports our second hypothesis.

Model D3 and D4 test whether the middle class is differentiated with regard to internal and external mobility over the *higher grade-lower grade* boundary. In these models the scaling parameters of the high- and low-grade technocrats (I*a* = II*a*) are equated with each other and so are the scaling parameters of the high- and low-grade social and cultural specialists (I*b* = II*b*). The differences between Model D3 and D4 are that Model D3 assumes that there is also inheritance of class positions (weak version of internal homogeneity) while Model D4 does not (strong version). Model D4 significantly worsens the fit relative to that of Model D3 according to L^2 and BIC scores, for both men and women. However, note again that none of these models fit the data better than Model A3. Again, the conclusion must be that heterogeneity of all the four middle fractions prevails. Note, however, that Model D3 fits the data better than Model D1, though only marginally so for men. This implies that collapsing over the status boundary would harm the conclusions less than collapsing over the new class boundary.

4.5. Heterogeneity of class positions over time

In order to test our third hypothesis on historical developments, Table 3 shows models for the over-time dynamics of class positions between 1970 and 2006, divided into seven periods. All models in Table 3 also contain a parameter φ for the off-diagonal association that freely varies over periods, to control for the overall trend in social fluidity. Fig. 5 presents these association parameters of Model E3[6] over the seven 5-year periods for men and women separately. It confirms earlier analyses of similar data (Ganzeboom and Luijkx, 2004a,b), that in the Netherlands the association between origin and destination has gradually, but consistently weakened between 1970 and 2006 for men, while the association for women in the first three periods increased and then has decreased gradually as well. In the most recent period, the association between origin and destination is almost equal for men and women. It is against this background of overall decrease in association that we address trends in immobility patterns among the middle class fractions.

Model E1 is the fully heterogeneous model, which allows class scalings to vary freely between the seven tables, while imposing no constraint on the diagonal cells that represent direct inheritance of class positions. These heterogeneous scalings are found to be remarkably similar between tables, as the comparison with the fully homogeneous Model E2 shows. Thus this over-all test suggests that the relative class positions have remained the same and this is confirmed by a further in-depth analysis with linearly constrained scalings (not shown). In particular the results do in no way confirm the third hypothesis that the distance between social and cultural specialist and technocrats in external mobility have widened over time.

However, significant over-time variations are found with respect to internal mobility, as the next batch of models shows. Our third hypothesis holds that the social and cultural specialists have become more immobile over time. Models E3–E8 of Table 3 build up to a detailed test of this hypothesis. Model E3 assumes that the class inheritances remain the same for all periods. (The inheritance parameters of this model are essentially the same as the inheritance parameters of Model A3 in Table 2 as presented in Fig. 4.) Model E5 assumes that the average level of inheritance common to all classes taken together (δ_{ii}) varies over time by a time-dependent constant. This is a significant improvement by classical criteria, but not measured by BIC. Model E5 assumes that the class inheritance of all classes (as modelled in E3) changes according to a linear trend. This is a clearly significant improvement for men, and marginally so for women. In Model E6 we group the diagonal densities for social and cultural specialist (Ib and IIb), technocrats (Ia and IIa) and the remaining classes, and these freely vary by period. While this model is not an improvement, it constitutes a useful baseline for a more detailed linear trend analysis. Model E7 respecifies Model E5 by separating this single slope into three, one for the social and cultural specialists, one for the

[6] These parameters could have been taken from the other models in Table 3 as well – there are essentially insensitive to the treatment of the diagonal densities.

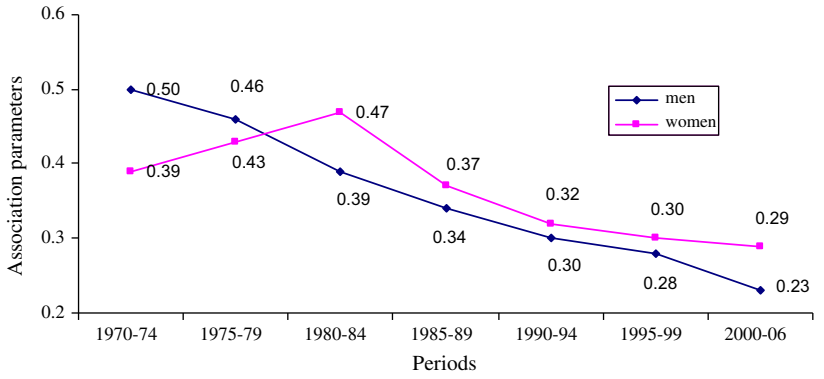


Fig. 5. Trends in association between origin and destination class between 1970 and 2006.

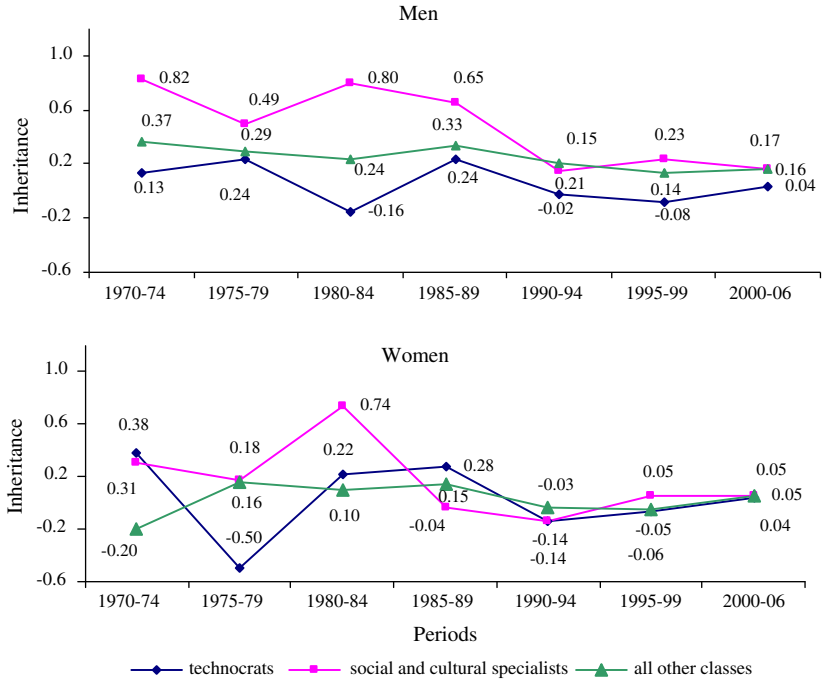


Fig. 6. Trends in inheritance of class position of the technocrats, the social and cultural specialists and the other social classes over periods (between 1970 and 2006) for men and women (Model E6 of Table 3).

technocrats and one for the remaining classes; Model E8 does the same with a two slope model, in which inheritance of class positions among social and cultural specialist is treated separately from that of the other classes.

Best-fitting amongst Models E1 through E7 for men is the one slope Model E5, but the two slope Model E8 comes close. For women the one slope Model E5 is second to the no-slope model, but the estimated slope in Model E5 is still marginally significant. Fig. 6 displays the parameters for the inheritance of class position, as estimated in Model E6. For men the results imply that direct inheritance is significantly declining for *all* classes and that there is weak evidence that the down trend among social and cultural specialist is steeper than among the other classes. This is a strong rejection of hypothesis 3. For women, we do not find string evidence for any trend, which is a somewhat weaker rejection of the hypothesis. In summary, we have not found any support for our third hypothesis, that the social and cultural specialists become relatively more immobile over time.

5. Conclusions and discussion

We have examined the patterns of intergenerational mobility of the middle-class fractions as distinguished by Güveli (2006) and Güveli et al. (2007a): a technocratic and a social and cultural specialist fraction within the middle class with both

a higher and a lower *echelon*. We have investigated whether these assumed middle-class fractions have specific mobility patterns and consequently differentiate themselves as separate social classes.

Our first hypothesis stated that the technocrats exchange more with lower classes than the social and cultural specialists. This turned out to be true. It is indeed easier for the offspring of the lower classes such as skilled, unskilled and agricultural workers to end up in the classes of the high- and low-grade technocrats than in the classes of the high- and low-grade social and cultural specialists. Our results also imply that both the high- and low-grade social and cultural specialists are more successful in preventing their offspring from downward mobility than the high- and low-grade technocrats. These results fully support our expectations. This finding is also consistent with the study by Goyette and Muller (2006), showing that college students from the working class are more likely to major in technical fields or business than students from middle class families.

Unexpected, but interesting is the finding that if one were to collapse the middle class fractions, it would be better to do this over the high–low boundary than over the technocrats/social and cultural specialists' boundary. The exchanges between the high- and low-grade social and cultural specialists on the one hand and the remaining classes on the other, and exchanges between the high- and low-grade technocrats and the other classes are almost the same according to the *external homogeneity* criterion. This means that making a *high–low* distinction within the social and cultural specialists and among the technocrats is not as necessary as it is the new class distinction.

Our second hypothesis stated that the high- and low-grade social and cultural specialists inherit their fathers' class positions more often than do the high- and the low-grade technocrats. Bourdieu (1984) claimed that it is easier for the social and cultural specialists to transmit their class-specific resources to their offspring whereas this is relatively difficult for the incumbents of other occupations to acquire these resources. The estimated immobility parameters indeed show that both the low-grade and especially the high-grade social and cultural specialists inherit more often their origin class than the high- and low-grade technocrats. Our results support the second hypothesis for men, but not for women. Against our expectation, women with a technocrat father are even more likely to stay in their father's class than women with a father in the class of social and cultural specialist and men from technocrat origins. That is, women having the opportunity to inherit a company or organizational assets from their father are more inclined to take this opportunity than men in similar position. One interpretation may be that exactly because women with these opportunities are so rare, this gives them a privileged position and motivates them to stay in their favorable status position. However, the inter-generational mobility patterns of women do not fit as neatly into our conceptual scheme as those of men and would deserve closer scrutiny in future research.

Our third hypothesis stated that the social and cultural specialists would become relatively more immobile over time. Note that the overall association between class of origin and destination in the Netherlands has decreased over time: most dramatically and consistently for the whole period (1970–2006) for men, but also for women towards the second part of this period. Therefore, the over-time development of the immobility of the assumed classes should be read against the backdrop of increasing social fluidity. Having said that, we found no confirmation for our trend hypothesis on immobility of new class fractions. The transmission of class position to offspring is strong for the social and cultural specialists relative to the other classes in the early periods, but we see a clear downward trend thereafter, in particular for men. Inheritance of class position of women in the class of the technocrats as well as in the class of the social and cultural specialists decreases somewhat too, but this trend is not as salient as it is for men.

Our hypotheses have been tested on data for the Netherlands, which constitutes a perfect site for our research aims. Not only has mobility research from this country produced a wealth of high-quality, detailed and long-ranging intergenerational data, but Dutch society represents an extreme point of the development toward post-industrialization, with almost 50% of all workers in the middle classes. There is strong evidence, confirmed by our analysis that a general and steady trend towards more social fluidity has emerged. It is exactly for these situations that new class theorists have questioned the validity of traditional class schemata and speculated about the rise of new inequalities in line with distribution of the cultural and human resources in post-industrial workforces. The truth of such claims can be effectively tested in the Netherlands. While our analysis clearly confirms that technocrats and social and cultural specialists constitute separate classes with respect to their intergenerational mobility pattern, we do not find any sign of *rising* inequalities, nor evidence that the collapsing of these classes in the conventional EGP class scheme helps to explain the general trend towards social mobility in this post-industrial society. Whether our findings are peculiar to the Dutch mobility regime or would generalize to other welfare states, or in fact occurs independently of welfare regimes, must be left for further research.

It has often been argued that social classes are "dying" (Clark and Lipset, 1991; Pakulski and Waters, 1996), especially in the last two decades of the past century. Others have made attempts to convince scholars about "the promising future of class analysis" (Goldthorpe and Marshall, 1992) and the need to "salvage social class" (Sørensen, 2000; Grusky and Weeden, 2001). To rescue social class, some authors have also attempted to adjust the existing class schemata (e.g. Oesch, 2006). We concur with these attempts and encourage scholars to use mobility patterns to further map out class distinctions. We suggest that the external and internal homogeneity criteria as applied in this paper are useful tools to do so. We have effectively shown in this study that these criteria can be used to validate a class distinction.

To salvage social class, Grusky and Weeden (2001) have come up with a new social class agenda. They claim that some scholars have prematurely announced the death of class because existing social class concepts would use overly aggregated occupational groupings and disguise important differences on the disaggregated level. Class effects are only to be found at the more disaggregated level of occupational groupings since the associated closure devices, *e.g.* credentials, licences, unions and private property, primarily operate on this level. More recently, Weeden and Grusky (2005) have proposed a schema that

consists of 126 occupational groups that are supposed to represent all social classes in the US. Our results support the idea that existing class schemes are too aggregated, especially in the middle class. Unfortunately, the Weeden and Grusky's (2005) very fine distinctions can hardly be applied to moderately sized datasets such as ours. Another downside of their approach is that they disaggregate social classes to such a level that one can hardly recognize them as classes: they are mere occupations. We feel that the moderately fine distinctions we have made in our research are an important compromise between crude and fine distinctions.

Appendix A

See Tables A1–A3.

Table A1
Data sources for international occupational mobility among men and women in the Netherlands between 1970 and 2006.

Study		Abbreviated study title	Men (*N*)	Women (*N*)
1	net70	National Election Study 1970–1973	746	153
2	net71	Parliamentary Election Study, 1971	693	138
3	net74p	Political Action Survey I, 1974	348	280
4	net76j	Justice of Income Survey, 1976	618	66
5	net77	CBS Life Situation Survey, 1977	1300	366
6	net77e	Parliamentary Election Study, 1977	510	117
7	net79p	Political Action Survey II, 1979	580	470
8	net81e	Parliamentary Election Study, 1981	637	621
9	net82e	Parliamentary Election Study, 1982	488	430
10	net82n	National Labour Market Survey, 1982	833	823
11	net82u	National Prestige and Mobility Survey, 1982	410	180
12	net85o	Strategic Labour Market Panel Survey, 1985	967	470
13	net86e	Parliamentary Election Study 1986	494	473
14	net87c	CBS Life Situation Survey 1986	907	482
15	net87c	Cultural Changes [ISSP] 1987	519	561
16	net87j	Justice of Income Survey 1987	300	282
17	net87s	Primary and Social Relationships, 1987	320	309
18	net88o	Strategic Labour Market Panel Survey, 1988	496	281
19	net90	Social and Cultural Trends, 1990	896	793
20	net90o	Strategic Labour Market Panel Survey, 1990	448	244
21	net91j	Justice of Income Survey 1991	436	321
22	net92f	Netherlands Family Survey I, 11992–93	774	753
23	net92o	Strategic Labour Market Panel Survey, 1992	451	258
24	net92t	Telepanel Stratification Survey	796	718
25	net94e	Parliamentary Election Study, 1994	587	536
26	net94h	Household in the Netherlands pilot, 1994	369	479
27	net94o	Strategic Labour Market Panel Survey, 1994	384	253
28	net95h	Household in the Netherlands pilot, 1995	850	788
29	net95s	Social and Cultural Trends, 1995	735	765
30	net96	Social Inequality in the Netherlands, 1996	315	272
31	net96o	Strategic Labour Market Panel Survey, 1996	589	405
32	net98	Social and Economic Attitudes, 1998	372	229
33	net98e	Parliamentary Election Study, 1998	590	627
34	net98f	Netherlands Family Survey II, 1998	871	857
35	net98o	Strategic Labour Market Panel Survey, 1999	961	710
36	net99	Use of Information Technology, 1999	1027	698
37	net99a	Use of Government Services, 1999	2284	2697
38	net99i	International Social Survey Programme, 1999	456	391
39	net00f	Netherlands Family Survey III, 2000	639	639
40	net00s	Social and Cultural Trends, 2000	416	395
41	net02e	European Social Survey, 2002	671	796
42	net03	Netherlands Kinship Panel Survey, 2004	2635	3583
43	net03f	Netherlands Family Survey IV, 2003	798	822
44	net04e[a]	European Social Survey, 2004	521	684
45	net04i[a]	International Social Survey Programme, 2004	700	537
46	net06e[a]	European Social Survey, 2006	565	623
47	net06i[a]	International Social Survey Programme, 2006	664	638
Total			32965	28013

See for more information: www.harryganzeboom.nl/ismf.

[a] These files have been added to the database used in Ganzeboom and Luijkx (2004b). A data file with all data processed can be obtained from the third author. Counts have been reweighted using post-stratification weights where available, for women and men separately. Duplicated cases in the Strategic Labour Market Panel Survey 1985–1998 have been reweighed to the person level.

Table A2
Outflow percentages for men in the labor force between 1970 and 2006.

Origin (fathers' class)	Destination (sons' class)													
	Ia	Ib	IIa	IIb	IIIa	IIIb	IVa	IVb	V	VI	VIIa	VIIb	IVc	Total *N*
Ia	26.4	4.3	21.4	13.7	9.7	3.6	2.5	1.6	2.5	6.5	6.7	0.5	0.5	3689
Ib	25.9	16.5	18.4	15.5	7.7	2.7	1.9	2.4	1.3	4.3	3.2	0.3	0.0	375
IIa	19.8	2.9	24.1	12.4	11.5	4.1	1.5	1.8	3.5	8.9	8.6	0.4	0.6	3482
IIb	18.3	4.7	20.0	26.9	10.5	3.7	1.0	1.0	2.0	6.0	5.3	0.4	0.4	1556
IIIa	16.9	2.5	20.0	14.6	16.5	4.6	1.1	1.3	2.6	11.0	8.2	0.2	0.4	2560
IIIb	13.4	1.0	18.9	12.4	13.2	9.1	1.2	0.9	2.8	15.2	10.2	1.0	0.7	864
IVa	18.1	2.1	17.0	9.3	10.8	5.6	7.3	3.6	3.2	11.2	10.3	0.4	1.1	1380
IVb	12.8	1.4	14.2	9.5	11.7	4.6	6.1	7.3	2.8	14.4	13.6	0.7	0.9	2106
V	16.8	2.6	19.4	8.7	9.3	3.5	0.9	1.7	8.8	14.9	12.1	0.5	0.7	1334
VI	10.7	1.0	14.3	8.7	11.0	4.5	1.5	1.6	5.0	25.0	15.3	0.8	0.6	5983
VIIa	9.9	1.2	12.2	6.5	10.8	4.1	1.2	1.6	5.0	22.4	22.6	1.6	1.0	5060
VIIb	8.0	0.7	9.8	4.6	8.0	3.5	1.6	1.7	4.3	24.7	23.8	5.5	3.7	1082
IVc	10.5	1.4	11.2	6.9	7.3	3.2	1.9	1.7	3.6	12.4	13.9	4.6	21.5	3501
Total	15.0	2.2	16.5	10.6	10.8	4.2	2.0	2.0	3.9	15.3	13.2	1.3	3.0	32972

Table A3
Outflow percentages for women in the labor force between 1970 and 2006.

Origin (fathers' class)	Destination class (daughters' class)													
	Ia	Ib	IIa	IIb	IIIa	IIIb	IVa	IVb	V	VI	VIIa	VIIb	IVc	Total *N*
Ia	8.7	4.3	12.3	27.4	23.2	11.2	0.8	1.7	0.6	1.5	7.7	0.2	0.4	3446
Ib	9.0	11.5	12.0	34.4	19.8	5.6	0.7	1.7	0.5	0.5	4.4	0.0	0.0	410
IIa	5.2	3.0	13.1	22.6	26.7	13.9	0.8	1.7	0.4	2.0	9.9	0.4	0.2	3356
IIb	6.3	5.4	10.2	35.3	21.0	10.2	0.4	1.1	0.1	1.5	8.2	0.2	0.1	1514
IIIa	4.9	2.6	8.4	23.9	30.7	13.7	0.9	1.4	0.3	1.9	10.9	0.3	0.0	2209
IIIb	3.5	1.7	6.9	13.6	29.0	17.8	1.1	2.7	0.1	3.2	19.9	0.4	0.1	749
IVa	2.6	2.1	10.8	20.0	25.9	18.6	1.5	2.6	0.2	2.7	12.3	0.2	0.5	1288
IVb	3.7	2.1	8.7	15.7	22.8	17.8	1.8	4.6	0.5	3.8	18.0	0.3	0.3	1506
V	4.8	2.0	13.1	15.2	25.8	15.6	0.9	1.7	0.4	3.3	16.0	0.6	0.5	1122
VI	3.0	1.2	8.2	12.5	24.2	17.6	0.9	2.1	0.6	4.4	24.5	0.6	0.4	5053
VIIa	2.7	0.9	7.2	9.8	22.0	19.5	0.8	2.0	0.6	5.0	28.1	0.9	0.5	4097
VIIb	1.7	0.6	5.5	10.9	17.7	16.0	0.8	1.9	0.1	4.0	37.7	1.9	1.1	724
IVc	3.1	1.8	9.6	16.8	18.2	15.3	1.1	2.6	0.3	2.8	21.4	3.5	3.5	2534
Total	4.4	2.4	9.7	18.6	23.8	15.5	0.9	2.1	0.4	3.1	17.6	0.8	0.6	28008

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