Direction des Statistiques Démographiques et Sociales

N° F0705

**IS PROTOTYPE ESeC RELEVANT
A CLASSIFICATION
TO DEPICT EMPLOYMENT RELATIONS IN FRANCE ?**

Cécile Brousse, Olivier Monso et Loup Wolff

Document de travail

INSEE

Institut National de la Statistique et des Etudes Economiques

N°F0705

Is prototype ESeC relevant a classification to depict employment relations in France ?

Cécile BROUSSE
(Division Emploi)
Olivier MONSO
(Division Emploi)
Loup WOLFF
(Direction de l'Animation, de la Recherche, des Études et des Statistiques)

Avril 2007

Titre français : « Le prototype ESeC est-il une nomenclature pertinente pour décrire les relations d'emploi en France ? »

This working paper corresponds to the validation report made under the European Commission Sixth Framework Programme, Contract No CIT2-CT-2004-506452 :
« Development of a European Socio–economic Classification (ESeC) »

I Is prototype ESeC relevant a classification to depict employment relations ?

Insee is very favourable to the emergence of a European socio-economic classification and to its introduction into the core variables for data sources on EU households. The European Socioeconomic Classification (ESeC) project, financed by the European Commission, proposes that the choice be made in favour of a classification largely based on a description of the world of work, without taking into account other explanatory factors of "social positions" (economic, cultural, social capital, etc.). This project gave the occasion, for a consortium of European researchers and statisticians, to propose studies on the pertinence of ESeC.

This working paper is arranged in three parts. Written by Cécile Brousse, the first part shows the usefulness of automatic classification techniques to test prototype ESeC and produce alternative classifications. In the field of wage earners, it highlights classifications of occupations combined supervisory status that are more coherent with the conceptual basis of employment relations. It also displays classifications covering other aspects of socio-economic positions (working conditions, education, wages...). In the second part, Loup Wolff reveals that there was a trend towards a more heterogeneous composition of supervisors as a category since the 80's. His research indicates that the inclusion of supervisory functions as proposed for the prototype ESeC might not be stable over time. Finally, Olivier Monso provides an estimation of social career mobility assessed through prototype ESeC and through national classification. His comparison seems to show that prototype ESeC generates more inter-class mobility than the national classification.

Key words : socio-economic classification, European harmonization, hierarchical position, social groups, employment relations, social mobility.

Français

L'INSEE est très favorable à l'émergence d'une classification socio-économique européenne et à son introduction au sein des variables communes aux données européennes sur les ménages. Le projet européen de classification socio-économique (ESeC), financé par la Commission européenne, a pris le parti d'une classification en grande partie fondée sur une description du monde du travail, sans tenir compte d'autres facteurs explicatifs des « positions sociales » (capital économique, culturel, social, etc.). Ce projet a donné l'occasion, pour un consortium de chercheurs et de statisticiens européens, de proposer des études sur la pertinence d'ESeC.

Ce document de travail comporte trois parties. Écrite par Cécile Brousse, la première partie montre l'utilité des techniques de classification automatique pour tester le prototype ESeC et produire des classifications alternatives. Dans le champ des salariés, elle fait émerger des combinaisons de métiers et de satut d'emploi qui sont plus cohérentes avec les concepts de base liés aux relations d'emploi. Elle construit également des classifications couvrant d'autres aspects des positions socio-économiques (conditions de travail, éducation, salaires...). Dans la deuxième partie, Loup Wolff met en évidence la tendance à l'hétérogénéité plus grande de la catégorie des « superviseurs » depuis les années 80. Son étude indique que la prise en compte des fonctions de superviseur, comme proposée dans le prototype ESeC, pourrait ne pas être stable au cours du temps. Enfin, Olivier Monso fournit une évaluation de la mobilité sociale en cours de carrière avec le prototype ESeC et avec la classification nationale. Cette comparaison semble montrer que le prototype ESeC produit plus de mobilité inter-classe que la classification nationale.

Mots-clés : nomenclature socio-économique, harmonisation européenne, position hiérarchique, groupes sociaux, relations d'emploi, mobilité sociale.

Table

Foreword

Context

Insee is very favourable to the emergence of a European socio-economic classification and to its introduction into the core variables for data sources on EU households. Comparative analysis of the main social indicators can be enriched, we feel, through the use of such a classification. France already has a strong tradition of work on social groups at the national level, which has demonstrated the usefulness of this approach in our country. That is why Insee wishes to support the process of study for a "socioeconomic" classification at the level of the European Union, that is, a classification in 5 to 10 groups that would allow social inequalities to be accounted for. It is also for this reason that several Insee experts participated along with researchers from six other countries in the European Socio-economic Classification (ESeC) project.

The ESeC project was financed by the European Commission (DG Research) in the context of the 6th Framework Program and took place between September 2004 and September 2006. It was led by the research teams of the universities of Essex and Warwick (UK), and coordinated by the UK statistics institute (ONS).

The ESeC project proposes that the choice be made in favour of a classification largely based on a description of the world of work, without taking into account other explanatory factors of "social positions" (economic capital, cultural, social, etc.) Such a choice can obviously be open to criticism – more global and/or empirical approaches might have had certain advantages – but there currently exist few convincing alternatives. More precisely, the ESeC project has developed an interesting approach toward construction of a socioeconomic classification – attempting, on the one hand, to give it a theoretical foundation (based on employment relations), and on the other an operational basis, defining it via a matrix based on the international classification of occupations (ISCO) and a small number of additional variables.

Aims of the report

Initially, the purpose of the mission entrusted to the French team in agreement with the consortium members was to find out how prototype ESeC would be capable of describing employment relations in France as defined by John Goldthorpe. This question in fact broke down into many smaller conceptual and methodological questions. What criteria should be used to define employment relations in the French context ? What methods can be implemented to measure the adequacy of prototype ESeC with employment relations ? In that respect, how relevant is the use of automatic classification techniques ? But, it very quickly became apparent that a wider range of questions should be raised especially regarding the stability of the proposed classification. Are we assured that the composition of prototype ESeC nine classes are stable enough over time ? Doesn't prototype ESeC generate too much inter-class mobility ? Aren't employment relations fundamentally a temporary characteristic while the socio-economic situation should be a rather permanent characteristic ? To answer all these questions, this report is arranged in three parts:

Written by Cécile Brousse, the first part shows the usefulness of automatic classification techniques to test prototype ESeC and produce alternative classifications. In the field of wage earners, it highlights classifications of occupations combined supervisory status that are more coherent with the conceptual basis of employment relations. It also displays classifications covering other aspects of socio-economic positions such as working conditions, education and wages. In the second part, Loup Wolff reveals that there was a trend towards a more heterogeneous composition of supervisors as a category since the beginning in the 80's. His research indicates that the inclusion of supervisory functions as proposed for the prototype ESEC might not be stable over time. Finally in the third part of the paper, Olivier Monso provides an estimation of social mobility assessed through prototype ESeC and through national classification. His comparison shows that prototype ESeC generates more inter-class mobility than the national classification.

The general appendix focuses on the links between the national classification (PCS) and prototype ESeC. Cécile Brousse draws a comparison between PCS and prototype ESeC (Appendix C), Christel Colin and Louis-André Vallet study a cross-walk from national classification to prototype ESeC (Appendix D).

The first two paragraphs entitled *Summary* and *Further works on ESeC*, which includes the report's main conclusions and recommendations, can be read in isolation from the main parts.

Acknowledgements

---

[1] "French validation plans of the European socioeconomic classification with French statistical sources", Pierre Biscourp, Lisbon Conference, 19th-20th January 2006 and "How to validate prototype ESeC? An example on French data," Cécile Brousse, Bled Conference, 29th-30th June 2006.

Summary

PART ONE: Using automatic classification techniques to test prototype ESeC and produce alternative classifications

Using multivariate descriptive statistical analysis on occupations combined with hierarchical position (supervisory status), we show that as far as French wage earners are concerned, ESeC captures many aspects of employment relations (ER), but an alternative classification could take a better account of employment relations.

- Build up using cluster analysis, this empirical classification based on ER has points in common with prototype ESeC such as, in the intermediate part of the social hierarchy, and in the area of employment relations, the resemblance of blue-collar workers and employees in the most repetitive occupations.

- But the cluster analysis also highlights aspects that do not appear in the ESeC project, such as the specificity of the teaching professionals in terms of employment relations, and the proximity between civil servants whatever their occupation, the opposition between workers in small working unit or in craft industry and those in the industrial sector (including mass marketing).

The study addresses general questions about the validity of prototype ESeC and of Goldthorpe's class schema in the French context.

- If the purpose of a European classification is to describe employment relations, setting a part a class of supervisors might not be necessary.

- A smaller number of classes might even prove to be more relevant.

- Statistical analysis suggests that the classification should bring a higher degree of detail describing executives, professionals and technicians and less detail as regards blue and white-collars

- As shown by cluster analysis on individuals, some occupations might be heterogeneous in terms of employment relations.

For all these reasons, in this empirical work, the employment relationship framework is enriched by adding other dimensions of occupations such as task contents, work environment, level of education required (a dimension that is slightly different from asset specificity) and finally the wage drawing from the job. Several classifications using these additional variables are carried out and compared to prototype ESeC.

The study ends in assessing the advantages of conducting multivariate descriptive statistical analysis to build a socio-economic classification in a European context.

PART TWO: Transformations of the supervisory functions since the 80's

Underlying the ESeC prototype, John Goldthorpe's theoretical framework of the "employment relationship" puts the supervisory functions at the core of its classification principles. Occupying a supervisory position is in this perspective a sign of a higher position than the one given by the scale deriving in the first place from the ISCO classification. Such a strong assumption within the construction of a socio-economic classification is carefully examined.

Using the French COI Survey ('Organisational Change and ICT Use' survey) of 1997 the great heterogeneity of the work of supervision is described (that is having "one or more employees under their orders or their authority").

- A classification of supervisors is built distinguishing four groups: tutors, foremen, administrative supervisors, commercial and administrative directors.

- It seems that companies value and give different compensation to their supervising staff according to the type of supervising they are supposed to perform.

In 1984, 1991, 1998 and 2005 (dates of the four last waves of the INSEE surveys on Working Conditions), more than one employee out of five declares he/she endorses hierarchical responsibilities (full-time employees in private and public companies).

- We observe a constant need among companies concerning supervisory staff.

- The companies have greatly redesigned the social properties of the employees hired for these positions.

- Less qualified, lower placed in the wage hierarchies, benefiting from lower compensation levels, the employees that declare supervising other workers have lost today a part of the prestige (symbolic hierarchies and wage scales) which they still enjoyed at the beginning of the Eighties.

The devaluation of supervisory positions, which are in this model treated "by default" as valorised, could lead to a growth of the blurring in the classification.

PART THREE: Occupational mobility measured with prototype ESeC and national classification: two different perspectives

A brief analysis of occupational mobility is carried using prototype ESeC and national classification (PCS).

- It appears that prototype ESeC can reconstitute, in a very general way, the results obtained with classifications derived from France's PCS (for example the higher mobility of men, in particular among unskilled workers).

- But the analysis of mobility also points up specificities of ESeC: It creates more mobility than do the classifications derived from the PCS. A significant percentage of this additional mobility is related to variations in supervisory tasks (becoming a supervisor can result in a change of social group in ESeC) and more generally to variations in "organisational skills" between two occupations.

It is not surprising that the Prototype ESeC does not fully coincide with institutional criteria specific to France (French collective-bargaining agreements for example), given its vocation of being adapted simultaneously to a large number of countries. Nevertheless, we must ask whether these classification criteria with "universal" scope, intended for determining the social structure as well as the mobility of individuals in each country, can be implemented with pertinence and provide results interpretable in a (fairly) similar way. In particular, its internal coherence would have to be studied more in depth by posing the question of whether changes in ESeC category indeed correspond to concrete changes in the area of employment relations.

Further work on ESeC : a few recommendations

Great masses of data will be processed and published within the European Socio-economic Classification Clearly the choice of these classifications will reacts on the accuracy of the information transmitted by the statistics…This is why as members of statistical institute we think it is important to make a few recommendations for the building of a European socio-economic classification.

What uses for the European socioeconomic classification?

While the ESeC project has launched the process of reflection on a socio-economic classification, we feel that it is important, before continuing, that there be collective agreement on the expected uses of such a classification. We suppose – but we would wish for confirmation from Eurostat – that the vocation of this classification would be to produce classifications in the same form as the other "core variables," for example tables showing the average for a variable of interest for the socio-economic categories of each European

country (as well as for the European Union as a whole)[2]. This implies that the proposed classification should be understandable by the general public, and thus able to be used in political discussions[3].

First, the expectations regarding the classification itself (and in particular its structure) must of course be defined more precisely from a statistical point of view. For instance:
- What contribution is desired from the classification compared to other socio-economic "core variables" (diplomas, income, etc.): is it to summarise them, or complement them?
- For the needs of the EU, does Eurostat wish a classification in one level or several articulated levels?
- What maximum number of classes should be aimed for at the most aggregated level of the classification? 9 classes is the maximum for keeping a one-digit codification, but shouldn't fewer be aimed at?
- Validation work on the explanatory power of the classification naturally leads to finer classifications, but a large number of classes makes appropriation by the public more difficult, can increase problems of borders between classes (and diagnostic errors regarding occupational or social mobility, homogamy, etc.) and limit the size of samplings for each class.
- Do we want the socio-economic categories to be able to be arranged entirely according to a social hierarchy (which remains to be defined)? This choice would facilitate interpretation (in particular in terms of inequalities), but also has a disadvantage in that it represents a more reductive (or even caricatural) representation of reality.
- Do we want the social groups to be of comparable size (at least at the European level), or rather to opt for a fine description of the extreme socio-economic categories (or certain ones among them)? We might also raise the question of the minimum size of a class at the European or even the national level (for example, should agricultural workers be isolated in Britain or in France?).

The beginnings of answers to all these questions, of which some at least can come only from Eurostat, would be necessary if the work is to continue efficiently.

Testing alternative classification projects on European data

At this stage in the development of a European socio-economic classification, three possible orientations could be considered :
1) Continue working strictly within the framework of the prototype ESeC (maintaining the use of ISCO and of the proposed instrumental variables, but allowing for the possibility, for example, of revising the classification of certain occupations);
2) Reconsider the instrumental variables to be used – at least in an analytical phase – and possibly even the number of classes and their definition, while remaining within the general framework of the prototype ESeC, i.e. application of a derivation matrix to an occupational classification ;
3) Consider alternative approaches (e.g. a classification extending beyond the framework of labour, a subjective question asked of respondents on how they situate themselves in society, or any other project that might be proposed).

We are not favourable to the first solution, if only for operational reasons[4]. The third seems to us to be currently insufficiently "trail-blazed." We therefore propose choosing the second. This choice is based in part on the results of empirical work already done as part of the ESeC project. For example, it is possible to construct, using French data, variants which take the criterion of employment relations into account better than the proposed prototype. Of course, it is hardly surprising that for a given country, a European classification might perform less well than a national construction. Therefore it would be desirable for analogous studies be done by other countries (or at the European level). Beyond that, since the criterion of employment relations may not be sufficiently robust for separating social groups, at least in the case of France, we propose testing classifications that take into account qualification or the duration of the contract rather than – or in addition to – the concept of supervisor. Or, conversely, classifications constructed with a more reduced number of variables.

To the extent a classification of occupations such as ISCO would remain the basis for constructing the European socioeconomic classification, we would like to see study undertaken to assess the quality and the comparability of the ISCO data collected. We would also like the needs stemming from a socioeconomic classification to be taken into account in the current revision of this classification of occupations. We feel that

---

[2] This implies that we are to be permitted to compare persons belonging to the same category in different countries, and therefore that we no longer limit ourselves to defining the relative position of each citizen within his or her country.
[3] The alternative would be to consider such a classification as a tool reserved for experts, which the latter would use in studies or in research (of which only the conclusions – and not the methods - might eventually be widely disseminated).
[4] In particular regarding the concept of manager or supervisor, but also, for example, the size threshold to take into consideration for companies, etc.

it is more realistic to wait for the revision of ISCO to be complete before considering the implementation of a socio-economic classification that uses it in european sources.

Regardless of the orientation taken, it is indispensable that empirical work be done on European data, and in particular using harmonised sources (the Labour Force Survey and its Ad Hoc modules, EU-SILC, Family Budget Surveys, Time Use Surveys, etc.). Such work would demonstrate not only the advantages and disadvantages of these different classifications, in varied areas of application, but also their relevance for each State considered individually. The collection of a module of a European survey on this theme might also be considered.

Beyond that, since the criterion of employment relations may not be sufficiently robust for separating social groups, at least in the case of France, we propose testing other classifications that take into account qualification or the duration of the contract rather than – or in addition to – the concept of supervisor. Or, conversely, classifications constructed with a more reduced number of variables. To the extent a classification of occupations such as ISCO would remain the basis for constructing the European socioeconomic classification, we would like to see study undertaken to assess the quality and the comparability of the ISCO data collected. We would also like the needs stemming from a socioeconomic classification to be taken into account in the current revision of this classification of occupations. We feel that it is more realistic to wait for the revision of ISCO to be complete before considering the implementation of a socio-economic classification that uses it in european sources.

Regardless of the orientation taken, it is indispensable that empirical work be done on European data, and in particular using harmonised sources (the Labour Force Survey and its Ad Hoc modules, EU-SILC, Family Budget Surveys, Time Use Surveys, etc.). Such work would demonstrate not only the advantages and disadvantages of these different classifications, in varied areas of application, but also their relevance for each State considered individually. The collection of a module of a European survey on this theme might also be considered.

Solving problems of implementation

The definition of the classification must also take its planned statistical implementations into account: What are the sources in which the socioeconomic categories will be coded, and what information will be available to do so? For example, occupations cannot be coded in detail in all sources (at least in certain countries); neither can we include multiple instrumental variables in a census; the use of pre-existing registers restricts the information available, etc. The mode of collection must also be taken into account to evaluate the quality of the coding (will the latter be reliable in the case of a survey by proxy? by telephone?).

It is also desirable that statistical work of a more methodological nature be carried out prior to any systematic use of this classification in statistics:
- Does the classification produce similar results if it is implemented in different sources?
- In what proportion of cases will implementation of the classification need to be based on imperfect information (missing values, default coding, grouped ISCO codes, etc.) and what will be the incidence of these problems on the results?
- Regardless of the criterion used to construct the European classification, the pertinence of temporal evolutions in socio-economic positions must be verified, at the level of the individual and of the country.
- The move from classification of individuals to that of households deserves closer attention. Verifying that there is strong endogamy in the proposed classification would greatly facilitate this change.

Ensure that the classification is understood by the public

For the planned socio-economic classification to play an important role in the economic and social debate, the proposed categories (and their designations) must be understandable for the public. In its current version, the ESeC classification project is based on highly theoretical designations. For one thing, they must make it possible for everyone to recognise himself or herself in the classification; tests could be conducted on this.
Difficulties related to translation should also be identified very early in the development of the project, since they could lead to misunderstandings. Language issues reveal not only the variety of social representations, but also real national specificities in social structures.

In sum, the construction of a social classification is an important task. It is also a difficult undertaking –even more so at an international level, given the variety of national contexts. It deserves allocation of sufficient resources and time if we want a classification that is to become a reference for international comparisons and that will last.

PART ONE

USING AUTOMATIC CLASSIFICATION TECHNIQUES TO TEST PROTOTYPE ESEC AND PRODUCE ALTERNATIVE CLASSIFICATIONS

Cécile BROUSSE

INSEE
Employment Unit
timbre F230
18 boulevard Adolphe Pinard
75 675 PARIS
FRANCE

Cecile.brousse@insee.fr

Introduction[5]

The ESeC project has developed an interesting approach toward construction of a socio-economic classification – attempting, on the one hand, to give it a theoretical foundation (based on employment relations), and on the other an operational basis, defining it via a matrix based on the international classification of occupations (ISCO) and a small number of additional variables.

As prototype ESEC is deeply rooted in employment relationship framework the aim of INSEE study is twofold. First, answering the question whether prototype ESeC fits employment relationship conceptual framework. Second testing the relevance of employment relationship theory in the French context. Incidentally, this empirical work aims at developing a methodology based on clustering techniques that could easily be extended to European data sources and labour market.

As Goldthorpian theory mainly focuses on the relations between employers and employees, the validation study concentrates on the wage earners population only. So doing INSEE follows the example of the research team from Sweden and Germany. At the end of the study we will come back to these limits largely imposed by the consortium approach. As we produce several alternative versions of ESeC in this study, the version elaborated by the consortium in February 2006 (Harrison, 2006) is called "prototype ESeC" ER is used as an abbreviation for employment relations.

1. The validation of prototype ESeC: issues and method

Prototype ESeC aims to differentiate positions within labour markets and production units in terms of their typical 'employment relations'.

1.1 Theoretical hypothesis to be tested

In the Draft User Guide (Harrison *et alii*, 2006), ESeC project is presented as follows. "Among employees, there are quite diverse employment relations and conditions, that is employees occupy different labour market situations and work situations. Labour market situation equates to source of income, economic security and prospects of economic advancement. Work situation refers primarily to location in systems of authority and control at work, although degree of autonomy at work is a secondary aspect. The ESeC categories thus distinguish different positions (not persons) as defined by social relations in the work place - i.e. by how employees are regulated by employers through employment contracts". The forms of employment regulation depend mainly on the two dimensions along which work is differentiated: the degree of human 'asset specificity' involved, the extent of difficulty in monitoring work on the part of the employer. There are three forms of employment regulation:

1) "In a **'service relationship'** the employee renders 'service' to the employer in return for 'compensation' in terms of both immediate rewards (e.g. salary) and long-term or prospective benefits (e.g. incremental pay scales, assurances of security and career opportunities). The service relationship typifies Class 1 and is present in a weaker form in Class 2. Typical elements of the Service Relationship are:

    - long-term exchange of service for compensation
    - greater job security and employability
    - salary
    - incremental or similar payment systems
    - occupational pension and health schemes
    - greater control over the job and thus trust between employer and employee

2) In **'labour contract'** employees give discrete amounts of labour in return for a wage calculated on amount of work done or by time worked. Typically contracts are easily terminated and there are no prospective elements in the employment contract. The labour contract is typical for Class 9 and in weaker forms for Classes 7 and 8. Typical elements of the Labour Contract are:

- short-term exchange of effort
- payment by the time or piece
- no occupational pension or health scheme
- contract easily terminated
- low level of job security

3) Intermediate or 'mixed' forms of employment regulation that combine aspects from both forms (1) and (2) are typical in Classes 3 and 6.

The classification also separately identifies employers and the self-employed with no employees, with large employers in Class 1 and others in classes 4 or 5. Table 1 displays the classification in full. Appendix 1 provides a diagrammatic picture of the conceptual basis of ESeC. The version of the classification shown in table 1, which will be used for most analyses (the analytic version), has ten classes. For complete coverage, the three categories 'Students', 'Occupations not stated or inadequately described', and 'Not classifiable for other reasons' are added as 'Not classified'".

"Since the schema is designed to capture qualitative differences in employment relations, the classes are not consistently ordered according to some inherent hierarchical principle. However, so far as overall economic status is concerned, Classes 1 and 2 are advantaged over Classes 3, 6, 7, 8 and 9 in terms of greater long-term security of income, being less likely to be made redundant; less short-term fluctuation of income since they are not dependent on overtime pay, etc; and a better prospect of a rising income over the life course".

Table 1 : Prototype European socio-economic classification (February 2006 version)

Class	Title of class	Common Term	Employment regulation
1	Large employers, higher grade occupational, administrative & managerial occupations	Higher professionals	Service Relationship
2	Lower grade occupational, administrative and managerial occupations and higher grade technician and supervisory occupations	Lower professionals	Service Relationship (modified)
3	Intermediate occupations	Higher grade white collar workers	Mixed
4	Small employer and self employed occupations (exc. agriculture etc.)	Petit bourgeoisie or independents	-
5	Self employed occupations (agriculture etc)	Petit bourgeoisie or independents	-
6	Lower supervisory and lower technician occupations	Higher grade blue collar workers	Mixed
7	Lower services, sales & clerical occupations	Lower grade white collar workers	Labour Contract (modified)
8	Lower technical occupations	Skilled workers	Labour Contract (modified)
9	Routine occupations	Semi-skilled and unskilled workers	Labour Contract
10	Never worked and long-term unemployed	Unemployed	-

Source: Eric Harrison and David Rose , The European Socio-economic Classification (ESeC), Draft User Guide, Essex, University, 2006.

Figure 1 : The class scheme adapting adapting Goldthorpe (2000, Figure 10.2, p.223)
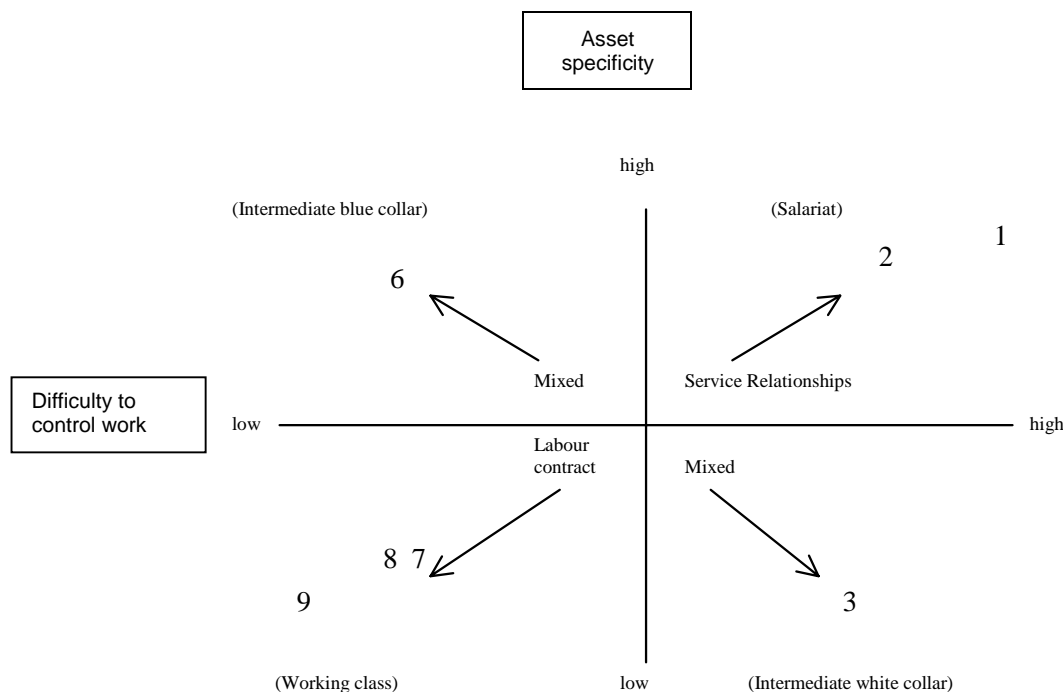
1.2   *Method to test prototype ESeC*

Most of the construction validation studies presented at Lisbon Conference (June 2006) by the members of the consortium answer problematics relatively remote from each other and rest on statistical techniques so that their results are weakly comparable. In an explicit manner among some (the Swedish and the German) more implicit among others (the English and the French in previous reports), the validations consisted essentially in comparing ESeC to already existing classifications. The question was then to know whether this new classification « captures » the employment relations more or less well than its homologous classifications. The classifications chosen as comparison point were very revealing of the positioning of research teams in the work group. The Swedish compare ESeC to EGP the most widespread international classification in the community of researchers, a classification to the construction of which Erikson, one of the researchers of the project has besides worked. As for English researchers their reference is the classification they have recently made adopt by the ONS, the statistical office of United Kingdom (official British classification, the NS-SEC).

In this new validation study, mainly oriented by consortium approach, as far as possible, we have limited ourselves to the rules defined by the promoters of prototype ESeC: minor groups of ISCO as basic bricks[6], same variable to define status of employment (supervisor versus ordinary salaried employee) and similar set of variables to characterize employment relations.

Using principal axes methods with automatic classification techniques makes it possible to identify classes and to measure their relative positions. The objective is to discover if prototype ESeC a classification that is set a priori is similar to one revealed after statistical analysis.

---

[6] In the contribution presented at Lisbon Conference, Insee did not use ISCO and the derivation matrix to build prototype ESeC but the French national classification of occupations (called PCS) (Biscourp, 2005). This approach was criticized by some of the consortium members who thought the mapping of PCS into prototype ESeC was wrong and even suggested another way to proceed. In fact the conclusions we reach do not depend on the classification used to derive prototype ESeC. Shall we use the international classification or the national classification, the main conclusions remain unchanged and this is why to make it easier for the reader who is not familiar with the French classification of occupations we choose here not to derive prototype ESeC from PCS but from ISCO and the derivation matrix as it is suggested in the draft user guide.

The main idea we develop here is simple: occupations have to be grouped together if they share the same characteristics and to manage to do so, cluster analysis seems appropriate because it is particularly relevant when characteristics are multidimensional. In the case of ER variables, comparing groups in terms of variables taken separately would not be conclusive.

Despite all these precautions, using multivariate descriptive statistical analysis on occupations we show that as far as French wage earners are concerned, ESeC prototype derives only imperfectly from the proposed theoretical framework of employment relations. If the objective of prototype ESeC were to capture employment relations, in French context another classification would have been more relevant. Finally, we suggest to group occupations according to a larger set of criteria including wage and level of education required by occupations, having in mind that ESeC is a socio-economic classification so that not only employment relations have to be taken in to account but also more basic socio-economic dimensions. The method developed here could have been extended to a larger framework; in particular, we could have produced classifications relying on different employment status variable (including or not the supervisory status).

The empirical work is based on the 2005 Working Conditions Survey which is a supplement to the 2000 Labour Force Survey (LFS)[7]. We use it to measure employment relations by occupation. In this survey, the main occupation at the date of the survey is coded in three-digit ISCO using a crosswalk from national classification (4-digit PCS).

Box 1: Two statistical sources: Working Conditions and Labour Force Survey 2005

The 2005 Working Conditions survey is a supplement to the 2005 Labor force survey. We use it to measure employment relations by occupation. In this survey, the main occupation at the date of the survey is coded in the 4-digit PCS but a crosswalk from the PCS to ISCO three-digits is used.

Labour Force Survey 2003, 2004 and 2005

This survey aims at observing both in a structural and short-term manner the situation of the persons on labour market. It comes within the framework of Labour Forces surveys defined by European Union. It is the only source providing a measure of the concepts of activity, unemployment, employment and inactivity such as they are defined by the ILO. The issues include employment, unemployment, training, social origin, situation one year before and monthly main situation over the last 12 months.

The Labour Force Survey is a quarterly survey and its collection is continuous over all the weeks of the year. Each quarter, roughly 35000 households (that is 35000 dwellings) that are some 75000 persons of 15 or more respond to the survey. In total every year, roughly 54000 different households respond to the survey, that is 115000 different persons of 15 or more. The collection is quarterly, on the other hand, the results of the survey are for the time being only published annually. Moreover the survey is performed continuously, every week of each quarter. A same dwelling is surveyed six times (the different waves being exactly spaced out over a quarter). The collection is performed under CAPI (computer aided collection), through a visit for the first and last survey of each dwelling and through the phone for the other interviews. If a person cannot (or does not want to) respond, another person of the household may do it in his (or her) place.

Working Conditions Survey

The first national survey on working conditions took place in 1978, the following surveys were performed in 1984, 1991, 1998 and 2005. This survey is the only one to provide a complete overview of the working conditions and organization on the middle or long term. As for the four previous surveys, the survey working conditions performed by INSEE and DARES in 2005 takes the form of a complementary survey to the continuous Labour Force Survey. It concerns only the persons belonging to the outgoing sixth of the survey. The collection takes place over the whole year 2005. 24000 individuals of 15 or more working on the date of the survey have been surveyed.

The questionnaire was designed jointly by the statistical service of the Ministry of Labour and by INSEE, within a steering group made up of researchers of the centre of studies on Employment, of the European foundation for the improvement of living and working conditions, of the CEPREMAP, of INSERM and of the Laboratory of work medicine (Lyon 1 University). The questionnaire allows detailed studies in a wide range of areas (Gollac *et alii,* 2005) including new forms of supervision (Volkoff, 1987 ;Wolff, 2006).

1.3   Sets of variables used to describe employment relations

Let us first characterize the information relevant to describe employment relations. To make easier the connection with Goldthorpian underlying concepts, variables are divided in three sets: variables related to asset specificity, variables measuring autonomy and those dealing with work contract.

---

[7] In the previous versions of the French validation studies (presented at Lisbon and Bled Conference), the 1998 Working Conditions Survey was used and results were very similar.

Asset specificity

The working conditions variables relevant to describe asset specificities are the following:

- job consists in repeating the same series of operations;
- job is complex;
- job requires reading/writing;
- the employee learns new things;
- work cannot be interrupted;
- instructions specify how to do the work as well as the work to do;
- employee deals with incidents on his/her own or calls to hierarchy;
- an error implies financial or security consequences for the employer;
- employee can be contacted after work;
- workstation rotation;
- when problems occur, employee asks peace of advice to person outside the company/organization.

For all respondents, we also have the highest degree. Using the degree in the analysis is more controversial. At that stage, we do not retain the degree as a measure of "expertise". But in order to assess the impact of this variable on the implementation of ESeC, we provide results where the degree is included (see part 3.2, page 34).

Autonomy versus subordination

The working conditions variables relevant to describe autonomy are the following:

- pace of work imposed by supervisors or machines or other technical constraints;
- person carries out instructions strictly;
- time schedule is decided by company/employer
- working hours are checked;
- when problems occur, employee asks superiors for advice;
- the person is director or one of his direct associates.

Work contract including less formalized aspects of contractual arrangements with the employer

The survey provides the type of contract: indefinite duration contracts vs. temporary contracts, as well as life employment contracts in the public sector. Tenure reflects the stability of the employment relation. We also make use of information on the employee's situation up to 18 months before. We retain two pieces of information: whether the person was employed in the same establishment 18 months ago, (and if so), what was the wage growth over the period. We also include more subjective information on the stability of the contract whether the employee fears redundancy. To assess "complicity" between employer and employee, we retain two indicators: that effort has effect or not on his/her career but also that he/she does extra-work without compensation. To enrich the description of pay system we introduce the fact of receiving extra-payments. We retain one more variable: whether the person has benefited during the last 3 months from training paid by his/her employer. We think that we are capturing the fact that employers invest more or less in employees. These variables should be relevant to inform on the type of contractual arrangement between an employee and his/her employer that is to say whether he/she enjoys a "service relationship" or a "labour contract" to use Goldthorpian vocabulary.

As emphasized in the introduction, the choice of variables/indicators necessarily rests on what can be identified/measured in French statistical sources. In particular, the presentation of the framework of employment relations made in the ESeC project, which places the accent on the degree of control the employer has over the employee, belongs more in surveys of employers rather than of employees. The choice of indicators also reflects our interpretation of concepts such as "asset specificity", "difficulty to control the job" which do not make immediate sense in the French context. The distinction between the three dimensions of employment relations is not always easy. For instance, the situation where job cannot be interrupted might indicates a low level of asset specificity and autonomy as well. All the variables being mixed up in the statistical analysis, it is not a serious problem.

1.4 The field of analysis: wage earners population

As we are expected to test the adequacy of prototype ESeC with employment relations framework the scope of the contribution is limited to employees population. In the French population it implies that more than 10% of the working population is set aside from the validation study (2,5 millions self-employed) to which we should add 2 millions unemployed. As two categories of prototype ESeC mixes employees and employers (class 1 and 2) it was decided to test the validity of the five "employees classes" (classes 3, 6, 7, 8, 9) and the "employees" part of mixed class 1 and 2. To put it differently employers in prototype ESeC class 1 and 2 as well as self-employed workers in class 4 and 5 are not included in this validation.

Defining employees

According to the rule defined by D. Rose and E. Harrison (February 2006), the division between employees and self-employed should be based on respondents own assessment of their employment status in their main job. The employees are those who answer "employee" to the following question.

> *Were you working as an employee or were you self-employed?*

In French Labour Force Survey, employees are identified through their response to the following question:

> B4   *What is your main occupation/job?*
>
> B5   *Do you exercise this occupation/job?*
>
>> 1)   *On your own account or as a salaried employer*
>> 2)   *As employee (other than salaried employer)*
>> 3)   *You work for or with a member of your family without being salaried* [8]

Wage earners employers are included in the analysis only when they declare they are working as employees .

1.5 Coding occupations and identifying supervisors

Defining occupations

Mapping into 3-digit ISCO(COM)-88 can be achieved whenever the 4-digit PCS as well as the 4-digit classification of economic activity are available, which happens to be the case in LFS. In French statistical sources, there is no possible mapping from national classification (PCS) into 4-digit ISCO(COM)-88. However, relatively few French sources allow the coding of occupations in ISCO(COM)-88 at the 4-digit level[9] (Biscourp, 2005). Indeed, all these difficulties stem from the fact that PCS and ISCO are based on fundamentally different logics (see appendix B, page 81). The national classification is a socioeconomic classification, based on widely known and measurable characteristics of employment relations in France:

- employment status i.e. employer or self-employed vs. employee;

- for employees, job classification according to collective agreements negotiated at the industry level. It reflects the amount of competence required by the job. In France, collective agreements determine wages, working conditions, and more generally employment relations to a large extent. Their coverage is better in the manufacturing than in the service industry.

- for a given classification, public sector (full security, life employment) contract vs. private sector contract.

As for international classification (ISCO) it is firstly an occupational classification and not a socio-occupational classification. The dominant criterion is "workplace" (thus the independent builder and the bricklayer are a matter of the same heading). They do not rest on the same criteria, do not present the same

---

[8] In French: B5 « Vous exercez cette occupation? 1) à votre compte, ou salarié chef d'entreprise 2) comme salarié (autre que chef d'entrepise) 3) Vous travaillez pour un ou avec un membre de votre famille sans être salarié »
[9] In most surveys describing social and cultural behavior, only the 2-digit level (CS, "catégorie socioprofessionnelle") is available. Even in surveys where occupation of the main job is coded at the 4-digit level, father's occupations for instance can only be coded at the 2-digit level of CS. There is no precise mapping from the CS into ISCO, not even at the 2-digit level of ISCO (Biscourp, 2005).

splits and are organized according to hardly compatible logics. The crosswalk from PCS to ISCO must therefore be used with caution for some occupations (Desrosières, 2005).

Defining supervisors

Supervisors are defined as persons who are responsible as their main job task for supervising the work of other employees. In the dataset, we have a supervision question which includes the number of people supervised. As it is recommended in the User Guide, we consider someone should be supervising at least three people in order to be regarded as a supervisor. The exercise of supervisory functions is identified thanks to the response to the following questions of the Working Conditions Survey:

> *- Q 23: Do you have one or more employees under your command or your authority?* [10]
> *- Q23a: If yes, how many?*

This question is slightly different from the own suggested by Rose and Harrison:

> *- In your job, did you have any formal responsibility for supervising the work of other employees?*

At that stage we do not restrict the supervisors' category to employees who are neither managers nor professionals as recommended in the User Guide. We will test later whether it is or not useful to make a distinction in the analysis between managers (or professionals) who do have subordinates and those who don't. In the second part of the report, Loup Wolff gives a detailed account of the group of supervisors. For a discussion of the effect of variation in the use of language between countries when addressing the question about supervisors see Bauer et alii, 2006 [11].

2. A classification of occupations derived from cluster analysis on employment relations

The general idea is the following: occupations have to be grouped if they share the same characteristics that is to say when they are associated with the same set of employment relations variables (i.e. the same means).

2.1 Occupation as statistical unit

Occupation is the basic unit for analysis. In this exercise, occupation is defined as a combination of:
$$[\text{ISCO minor group} * \text{hierarchical position}]$$

More precisely we use:

- minor group coded with three digits ISCO(COM)-88
- hierarchical position with two values:
    - employee with supervisory functions that is to say at least three subordinates
    - employee without supervisory functions that is to say no subordinate or less than three

Examples of occupations and their notations:

   232 for ordinary secondary education teaching professionals (i.e. who have no supervisory functions)
346_s for social work associate professionals who have supervisory functions

For the analysis, we only keep occupations having more than 50 individuals in the sample that is to say a total of 77 occupations (18 412 observations) and we set aside 105 occupations with number of observations from 1 to 49 (1 747 observations).

---

[10] In French: Q23 « Avez-vous une ou plusieurs personnes sous vos ordres ou votre autorité? », Q23a « Si oui combien? »
[11] Information on supervisory status as collected in different countries and various data sources are not easily comparable (Mannheim Study of Employment and the Family, Labour Force Survey and the European Social Survey). The authors suggested that further work is needed to improve the supervisory concept itself as well as its cross-national comparability.

2.2   Applying Principal Components Analysis

For each occupation, we compute the mean of the 68 variables describing employment relations (see Appendix 1, page 42). In a preliminary stage, we use principal components analysis to describe the set of data. We want to understand how the 68 variables measuring employment relations are related to one another as well as whether ressemblances exist among occupations.   So, the task is to analyse the rectangular matrix in which the columns represent the 68 ER variables and the 77 rows, which represent measurements of "occupations" on these variables. Each occupation is weighted according to its size. The method also provides a simple geometric representation of that information (Lebart *et alii*, 1983). It appears that four axis predominate , and account for 69% of total variance. The first axis represents 37% of total inertia, the second axis 17% The third and fourth axis represent respectively 9% and 6% of total inertia.

Characteristics of variables

We limit ourselves here to commenting on the first two axes. The characteristics of occupations such as "task complexity", "solving incident", "learning new things", "training by employer" (on the right) are opposite from "repetitive tasks", "no extra work", "no reading", "method fixed by hierarchy" (on the left). We propose to sum up the first axis by the term "cognitive contents and career prospect"

"Receiving extra payments", "pace of work dependent on technical constraints", "employed on a permanent contract in the private sector" at the top of the graph are opposite from "no pace surveillance", "no figured objectives", "employed on a life contract in the public sector". The opposition is less significant along the second axis, which contribution to total variance is smaller.

If job control by employer and "cognitive contents" are two significant dimensions of occupations as in the Goldthorpian conceptuel framework, these dimensions are not totally independent from one another (see figure 2). Some aspects of monitoring are correlated to "human asset specificity". For instance employees carrying tasks implying few cognitive contents have a greater probability that there work is easily controlled by hierarchy. As a matter of fact, employees who declare they don't learn any thing new cannot choose their time-schedule by themselves. On the contrary, those who carry out complex tasks and solve incidents by themselves are not subjected to working hours checking neither is their pace of work controlled by hierarchy. Contrary to what is suggested in Goldthorpian conceptuel framework, not every aspects of contractual arrangements are connected with these two dimensions. For instance occupations where the rate of wage earners on a temporary contract is high[12] are not all routine occupations

Characteristics of occupations

Distances between occupations are interpreted in terms of similar patterns of ER. Two occupations that are close in the space of ER must have similar value on the ER variables. For instance, on the graph, agricultural workers and watchmen display similar patterns of ER characterized by high proportion of those whose time schedule is determined by employer, who are not provided with training and learn nothing new when working.

The components analysis shows that in the case of France, for some occupations the hierarchical position (measured by the supervisory status) might capture some aspects of employment relations. This is particularly true for blue and white-collars whose job change radically when they have subordinates under their supervision. Positioned on the graph of principal components analysis, the centroids of main white and blue collars occupations and their supervisors counterparts are far removed from one another. For instance do they exercise supervisory tasks or not, housekeeping, restaurant service workers do not belong to the same part of the graph. They are nearly positioned in opposite faces along the first diagonal which means they are very different as far as ER are concerned (see figure 3). On the contrary, ordinary technicians and ordinary executive are close to technicians and executives with supervisory responsibilities (see figure 3). In that respect, it is relevant that prototype ESeC does not distinguish executives, professionals according to their supervisory status.

The components analysis also highlights occupations that are very close in respects of repetitiveness and the low cognitive contents: blue-collar workers, service workers, shop and market sales workers especially

---

[12] Temporary contract: fixed term, temporary employment agency contract, apprenticeship.

Figure 2 : Principal Component Analysis on ER variables, projection on axis 1 to 4

Projection on axis 1 (37%) and axis 2 (17%)

High control over work by employer	

- pace_machine
- hours_checking_other
- pace_surveil
- **rotation**

extra_payments

- hierarchy_help

figured_objective

permanent_contract

- strict_compliance
- **method_fixed_by_hierarchy**
- **repetitive**

no_extra_work

never_solve_incident

no_outside_help

reading_sometimes

- **writing_sometimes**

training_employer

- **complex_often**
- **writing_often**
- **new_things**

Limited cognitive content, no career prospect		High cognitive content and career prospect

-1,5

0

nothing_new

time_schedule_employer

no_training_employer

- **no_writing**
- **no_reading**
- **never_complex**

no_career_prospect

- **outside_help**
- extra_work_often
- **solve_incident**
- **not_repetitive**
- **method_chosen_oneself**

1,5

- civil_servant
- no_hours_checking
- **no_rotation**
- no_pace_surveil

no_figured_objective

no_extra_payment

- no_pace_machine

Low control over work by employer	

Projection on axis 3 (9%) and axis 4 (6%)

1

No responsability	

- can_not_be_contacted
- **no_financial_security_risk**
- time_schedule_flexible

- **break_possible**

number_years_firm0

- fear_redundancy

- **writing_often**
- **complex_sometimes**
- hierarchy_help
- **reading_often**
- **no_managerial_function**

permanent_contract

- no_hours_checking
- time_schedule_free

solve_incident_sometimes

Private employer		Public employer

-1,5

0

number_years_firm2

- career_prospect_high

managerial_function

- **writing_sometimes**
- no_hierarchy_help

1,5

- civil_servant
- hours_checking_hierarchy

no_fear_redundancy

- time_schedule_employer
- **break_not_possible**

- can_be_contacted
- **financial_security_risk**

Responsabilities	

Reading: distances in variables are interpreted in terms of correlation. For instance learning new things in one's work is positively correlated with often having complex tasks to achieve.

Note: characteristics that have a mean profile of distribution among types of occupations were suppressed.

Field: Wage earners, aged 15 or more, living in an ordinary household.
Sources: Working Conditions Survey, DARES, 2005 (provisional data) and Labour Force Survey 2005 , INSEE

20

Figure 3 : Projection of occupations on axis 1 and 2

Projection of occupations with high cognitive contents on axis 1 and 2

Prototype ESeC: xxx Class 1, xxx Class 2

Classification resulting from cluster analysis: **xxx** Class A, *xxx* Class B, xxx Class C, xxx Class D

Projection of occupations with low cognitive contents on axis 1 and 2

Prototype ESeC: *XXX* Class 7, xxx Class 8, **xxx** Class 9

Classification resulting from cluster analysis: **xxx** Class F, xxx Class G

Reading: Two occupational categories close on the first axis (graph 1) have similar value regarding the cognitive content of work. For instance the job of child minders and assemblers are similar as regards the amount of knowledge and skill involved but they do not face the same control from the employer. The former are more autonomous than the latter (axis 2) and they also have heavier responsibilities (axis 4).

Field: Wage earners aged 15 or more, living in an ordinary household.
Sources: Working Conditions Survey, DARES, 2005 (provisional data) and Labour Force Survey 2005 , INSEE

21

2.3 Cluster analysis on employment relations

We now use automatic classification techniques to group occupations having similar type of employment relations. As shown by hierarchical classification, the optimal number of classes should be 5 (see figure 4 and 5).

But we decide the number of classes should be 7 for comparability with prototype ESeC. In concrete terms, we combine hierarchical classification with clustering around moving centers. In fact the clustering around moving centers procedure does not affect the allocation of occupations in classes[13].

Box 2: Hierarchical classification combined with clustering around moving center

The algorithm[14] consists in first regrouping the 2 nearest occupations. From the starting 77 occupations, we find ourselves with a configuration of 76 classes. Thanks to the so-called Ward distance, the two nearest classes are regrouped. The operation of concatenation is repeated until we obtain a single class. From this algorithm is compiled the hierarchical tree and the histogram of the level indices which bring to the fore, when one goes from a configuration of n classes to n-1 classes, the intra-classes inertia gain (or inertia loss inter classes1) and therefore a degree of homogeneousness of the partition. For any partition of the occupations, the inter class inertia plus the intra class inertia is equal to total inertia which is constant. A gain of intra inertia at the time of the switch from a configuration of n to n-1 classes is equivalent therefore to an equal loss of inter inertia. The higher the loss, the more we will tend to reckon that the n class configuration is statistically a "good" configuration. This method has a limit: generally, these inertia « leaps » have mechanically more chance to be high for the configurations with smaller number of classes. So when we observe two equivalent inertia leaps for two different class numbers, we consider that the "best" of the two configurations is the one with the highest number of classes.

In the hierarchical tree (figure 5), the length of the stages is proportional to the inter class inertia loss generated by class regrouping. In the histogram of level indices, this loss can be visualized through comparing the successive importance of inter class inertia of the partitions. High losses of inter class inertia means that the two classes that have been regrouped were quite remote from one another. One will be able to consider that a "good" partition is a partition that precedes an important inter class inertia loss (or an intra class inertia gain which boils down to the same thing). It is this criterion, commonly admitted to choose the number of classes.

Figure 4 : Histogram of indices of hierarchical tree

```
Total inertia: 68.000000
       Loss of iner- !
  weighted Joint  tia inter !
Node  number classes 0/00 cum. dif !    Histogram
==================================================================================================
CL1   77.0 CL2-CL3 272 272 .   !************************************************************
CL2   43.0 CL4-CL10 75 346 197 !*****************
CL3   34.0 CL11-CL7  63 409 11 !***************
CL4   33.0 CL6-CL5   50 459 13 !************
CL5   17.0 CL9-CL27  37 497 13 !******** ↔ High inertia loss when going from 5 to 4 classes
CL6   16.0 CL8-CL13   35 532 2 !********
CL7   21.0 CL16-CL12  31 562 4 !*******
CL8   11.0 CL17-CL23  29 591 2 !******
CL9   14.0 CL15-CL18  22 613 6 !*****
CL10  10.0 CL20-CL28  21 634 1 !*****
CL11  13.0 CL14-CL22  19 653 2 !****
CL12   9.0 CL24-CL50  18 671 1 !****
CL13   5.0 CL29-412_5 17 688 1 !***
CL14   7.0 235_5-CL26 14 702 3 !***
CL15   7.0 CL25-CL32  13 715 1 !***
CL16  12.0 CL19-CL34  12 726 1 !**
CL17   6.0 CL21-CL40  11 738 0 !**
CL18   7.0 CL44-CL61  10 747 2 !**
CL19   8.0 CL37-CL47   9 756 1 !**
CL20   4.0 CL66-CL58   9 765 0 !**
```

Reading: the column « 0/00 » represents the inter class inertia loss (expressed in 0/00 in comparison with total inertia) when going from n to n-1 classes in the hierarchical classification procedure. It is the difference between inter class inertias of these configuration divided by total inertia and expressed in 0/00. To measure the relative strengths of these losses, one calculates inter class inertia leaps, the difference between inertia loss with n classes and inertia loss with n+1 classes. The column « dif. » represents the inter classes inertia leap. As inertia loss, it is divided by total inertia and expressed in 0/00.

---

[14] This presentation is taken from (Le Lan, 2005).

Figure 5 : Tree resulting from hierarchical classification of occupations by employment relations
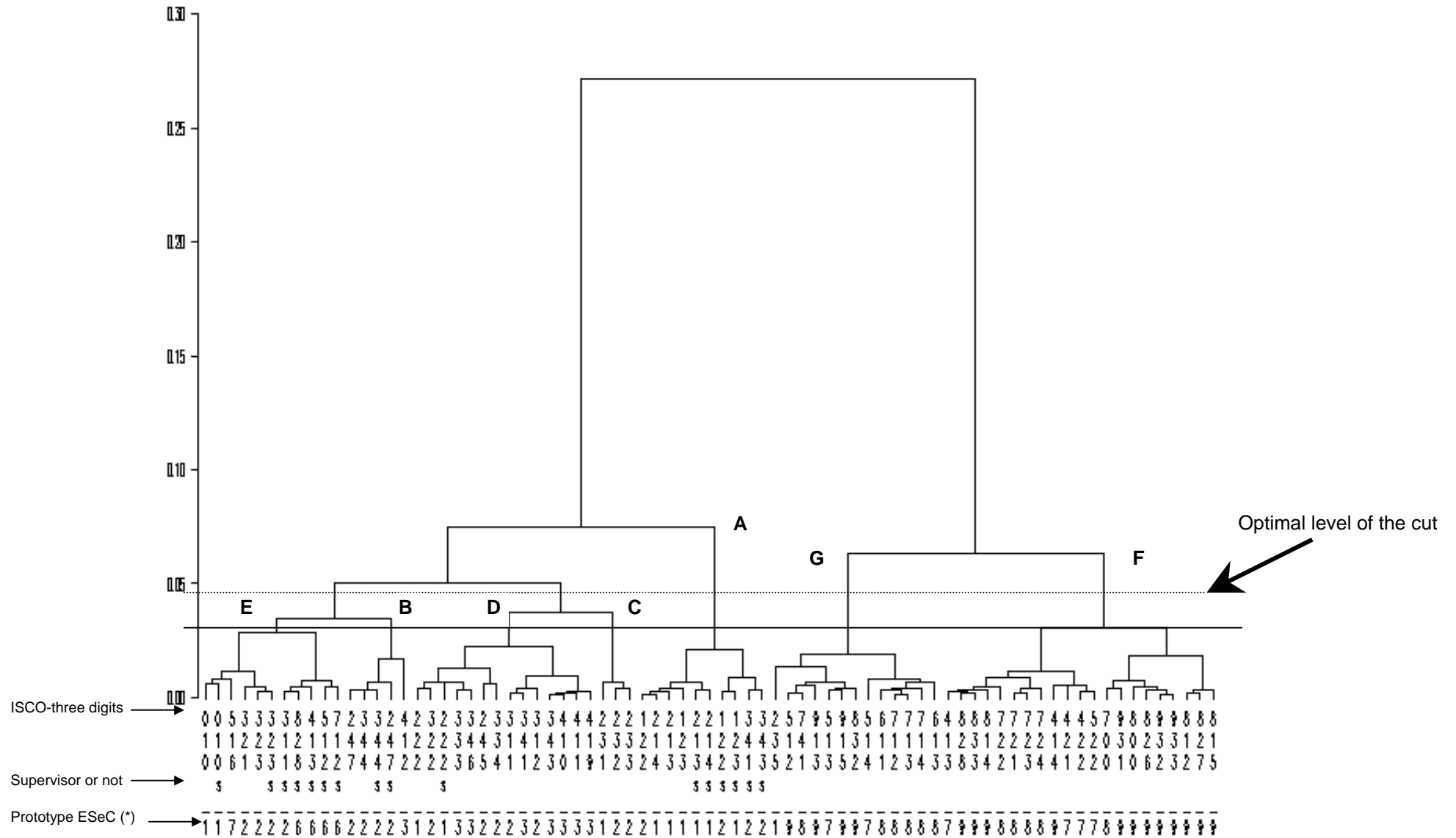
Reading: the closer two occupations in terms of employment relation, the higher their proximity in the tree
(*) For each occupation (ISCO minor group plus hierarchical position) the corresponding protype ESeC class is written.For instance, class B includes 4 occupations belonging to prototype ESeC class 2.

As prototype ESeC the classification obtained by hierarchical classification can be expressed by means of an algorithm (see derivation matrix appendix 6, page 51). The classification is organised around two great groups of similar size. The first group gathers non manual occupations (classes A, B, C, D and E) and represents 60% of paid workers whereas the second group mainly is composed of manual workers (40%) and includes classes F and G.

In the following presentation, the classes are ordered from A to G according to their position on the first axis of components analysis (axis measuring cognitive contents of the job and career prospect). In fact, on this axis, we have three sets of classes: the most routine occupations (class F and G), then intermediate occupations (class B, C, D, E) and finally occupations with the higher cognitive contents (class A). Classes F and G distinguish themselves on axis two and three, differences between classes B, C, D, E are noticeable on axes two and four. This presentation should make it easier to draw comparisons between prototype ESeC and empirical classification. Here is a description of the entire partition.

Class A: Managers and professionals in the private sector

In comparison to the whole wage earners, those of class A are 3 times more numerous to choose by themselves their work hours. They are twice less numerous to see their time use checked by the employer. If on average 5 wage earners out of 10 solve the problems by themselves, in class A, 7 out of 10 are in that situation. Moreover, most of the time these wage earners choose by themselves their work method (93% against 80%). When they encounter a difficulty in their work, they are twice more numerous than the others to call for a help external to the enterprise. They are four times more numerous to occupy managing functions (2.6% against 0.5%). Lastly nearly all these wage earners are employed under a contract of unlimited duration in the private sector (95% against 63% for the whole wage earners).

CLASS A *(13%)*

122_s	Production and operations managers (Supervisor)
122	Production and operations managers (Ordinary)
123_s	Other specialist managers (Supervisor)
123	Other specialist managers (Ordinary)
213_s	Computing professionals (Supervisor)
213	Computing professionals (Ordinary)
214_s	Architects, engineers and related professionals (Supervisor)
214	Architects, engineers and related professionals (Ordinary)
341_s	Finance and sales associate professionals (Supervisor)
343_s	Administrative associate professionals (Supervisor)

Class B: Public service administrative employees

If the salaried population counts one civil servant for 5 wage earners, the class B is made up essentially of civil servants (73%). Their time use is flexible for half of them (against only one case out of 5 in general population). They are twice more numerous to have followed a training in the exercise of their occupational activity (22% against 11% for the whole wage earners) and they are twice more numerous than the other wage earners to write in the framework of their functions. They have not much room for manœuvre to modify their remuneration or their career. But very few are those who fear a layoff (7% against 17% in general population).

CLASS B *(7%)*

247_s	Public service administrative professionals (Supervisor)
247	Public service administrative professionals (Ordinary)
344_s	Customs, tax and related government associate professionals (Supervisor)
344	Customs, tax and related government associate professionals (Ordinary)
412	Numerical clerks (Ordinary)

Class C: Teachers

The work of the wage earners of class C presents quite particular features. Nearly a half of the members of this class are not helped by a supervisor (against one out of three in general population). Their hierarchy

rarely checks their pace of work. Only one out of 10 of this class has assessed objectives (against 3 out of 10 among other wage earners). Scarce are the wage earners of this class who state they can interrupt their activity (82% against 40%). A very important part of their work rests on reading (nearly 4 out of 10 devote to it more than a half of their work hours) but a little less than 2 out of 10 in general population. Three quarters among them have the status of civil servant and only 6% have an unlimited duration contract in private sector. In two thirds of the cases, occupational errors they may make have no impact notably a financial one on the body that employs them. Lastly, these wage earners are twice more numerous than the other to declare they perform unpaid overtime.

CLASS C *(4%)*

231	College, university and HE teaching professionals (Ordinary)
232	Secondary education teaching professionals (Ordinary)
233	Primary and pre-primary education teaching professionals (Ordinary)

Class D: Clerks and employees in social and administrative occupations

The wage earners of class D have characteristics near from the average of the whole wage earners. If for several respects, they occupy an intermediate position, some features distinguish them nevertheless from the other wage earners. The hierarchy less supervises their pace of work than the one of the other wage earners (21% against 31%), it depends little on technical constraints (33% against 42%). They are less numerous than the others to receive assessed objectives (67% against 77%). They have a greater flexibility in the choice of their hours (32% against 22%). They are more scarcely submitted to a workstation rotation (82% against 72%). They are a little more numerous than the others to find their work rewarding (88% against 78%) and to request the help of outsiders to the enterprise if necessary (31% against 23%). But their investment in work is a little less likely to translate into remuneration or a promotion than the one of the other wage earners (65% against 57%).

CLASS D *(17%)*

222_s	Health professionals (exc. nursing) (Supervisor)
222	Health professionals (exc. nursing) (Ordinary)
245	Writers and creative performing artists (Ordinary)
312	Computer associate professionals (Ordinary)
322	Health associate professionals (exc. Nursing) (Ordinary)
333	Special education teaching associate professionals (Ordinary)
334	Other teaching associate professionals (Ordinary)
341	Finance and sales associate professionals (Ordinary)
343	Administrative associate professionals (Ordinary)
346	Social work associate professionals (Ordinary)
410	Office Clerks (Ordinary)
411	Secretaries and keyboard operators (Ordinary)
419	Other office clerks (Ordinary)

Class E: Technicians, supervisors and other intermediate employees

As the one of the wage earners of class D, the activity of the wage earners of class E does not present extreme characteristics, at most a few striking peculiarities which bring them nearer to the wage earners of the previous classes. Thus these wage earners have more important responsibilities than the average (84% against 67%), an error from them being able to lead to regrettable consequences for the enterprise or the administration that employs them. They have very often the occasion to read in the framework of their occupational activity. However, the two thirds devote to it less than a half of their work hours (against 54% for the other wage earners).

CLASS E *(18%)*

010_s	Armed forces (Supervisor)
010	Armed forces (Ordinary)
311_s	Physical and engineering science technicians (Supervisor)
311	Physical and engineering science technicians (Ordinary)
321	Life science technicians and related associate professionals (Ordinary)
323_s	Nursing and midwifery associate professionals (Supervisor)

323	Nursing and midwifery associate professionals (Ordinary)
413_s	Material-recording and transport clerks (Supervisor)
512_s	Housekeeping and restaurant service workers (Supervisor)
516	Protective service workers (Ordinary)
712_s	Building frame and related trades workers (Supervisor)
723	Machinery mechanics and fitters (Ordinary)
724	Electrical and electronic equipment mechanics and fitters (Ordinary)
828_s	Assemblers (Supervisor)

Class F: Workers in industrial occupations

The wage earners of class F are distinct from the other wage earners and notably from the classes described previously by the routine character of their work, a drawback they are twice more numerous than the others to mention, quite as the fact not to learn anything through their work. Less often than the others they are in a situation where they cannot find a solution to the incidents (44% against 28%). More than a half must stick to the orders given by the hierarchy, against a little more than a third of the other wage earners. In 30% of the cases the hierarchy, against less than 20% among the other wage earners, sets up the work method. Pace of work is checked directly by the supervisors (27%) and/or depends on technical constraints such as automatic speed of a machine or moving product (60% against 42%). Except for work hours these wage earners are less contacted than the others by their employer. Rotation of workstations is more frequent than elsewhere (43% against 28%). Lastly the fear to loose their job is almost twice more frequent than among the other wage earners.

CLASS F *(18%)*

413	Material-recording and transport clerks (Ordinary)
414	Library, mail and related clerks (Ordinary)
421	Cashiers, tellers and related clerks (Ordinary)
422	Client information clerks (Ordinary)
700	Craft and related workers (Ordinary)
721	Metal moulders, welders, sheet-metal workers etc. (Ordinary)
722	Blacksmiths, tool makers and related trades (Ordinary)
800	Plant and machine operators and assemblers (Ordinary)
812	Metal-processing plant operators (Ordinary)
814	Wood-processing and papermaking plant operators (Ordinary)
815	Chemical-processing plant operators (Ordinary)
826	Textile, fur and leather products machine operators (Ordinary)
827	Food and related products machine operators (Ordinary)
828	Assemblers (Ordinary)
833	Agricultural and other mobile plant operators (Ordinary)
931	Mining and construction labourers (Ordinary)
932	Manufacturing labourers (Ordinary)
933	Transport labourers and freight handlers (Ordinary)

Class G: Workers in sales, service, transport and construction occupations

The work of the wage earners of this class presents common features with the one of the wage earners of the class described above. In the first place, the fact not to acquire new knowledge (34%). But other aspects are opposite. More than a half of the wage earners of group G describe an occupational activity without complexity (against less than a third among the other wage earners), an activity not requiring the use of reading in more than half of the cases. Moreover, their work does not depend on a constraint of industrial nature. Thus for three quarters of these wage earners, pace of work does not depend on automatic speed of a machine or moving a product, the production objectives are not expressed in a quantitative form. Lastly these wage earners are distinct from the others because of the very low investment they are the subject, only 5% among them have benefited from a training and of very low seniority in the enterprise (less than two years for a third of them).

CLASS G *(23%)*

235	Other teaching professionals (Ordinary)
512	Housekeeping and restaurant service workers (Ordinary)
513	Personal care and related workers (Ordinary)
514	Other personal services workers (Ordinary)
522	Shop, stall and market salespersons and demonstrators (Ordinary)
611	Market gardeners and crop growers (Ordinary)
613	Crop and animal producers (Ordinary)
712	Building frame and related trades workers (Ordinary)
713	Building finishers and related trades workers (Ordinary)
714	Painters, building structure cleaners and related trades (Ordinary)
741	Food processing and related trades workers (Ordinary)
832	Motor vehicle drivers (Ordinary)
913	Domestic and related helpers, cleaners and launderers (Ordinary)
915	Messengers, porters, doorkeepers and related workers (Ordinary)

As shown by hierarchical classification, classes E and B are very close, as well as classes D and C. As a consequence, the optimal partition should be the following:

- managers and professionals in the private sector (class A);
- public service administrative employees, technicians, supervisors and other intermediate employees (class E and class B);
- clerks, employees in social and administrative occupations, teachers (class C and class D) ;
- workers in industrial occupations including mass distribution (class F);
- workers in sales, service, transport and construction occupations (class G).

Figure 6 : Hierarchy of clusters built by hierarchical classification on ER
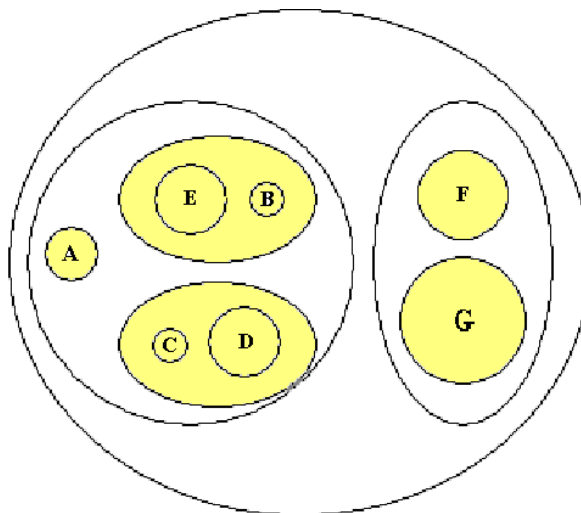
2.4 Differences between classification derived from cluster analysis on employment relations and prototype ESeC

By construction, applied to French data, the classification obtained through cluster analysis takes the criterion of employment relations into account better than the proposed ESeC prototype. Of course, it is hardly surprising that for a given country, a European classification might perform less well than a national empirical construction. Some differences may come from the mapping PCS-ISCO. At this stage, national information may be plugged into the analysis, and there are no safe guidelines to make this fully comparable from one country to the other (Biscourp, 2005).

To help interpreting differences between prototype ESeC and empirical classification on employment relations, we have positioned on the same two graphs the centroid of prototype ESeC classes (class 1 to 9) and the centroid of empirical classes (class A to G). Whereas empirical classes are distributed along the four dimensions, ESeC classes are nearly lined up along the first axis. To put it differently, prototype ESeC classes are ordered according to a unique dimension whereas the classification derived from automatic procedure reflects every aspects of ER. Prototype ESeC represents a more reductive (or even caricatured) representation of reality of employment relations or not all aspects of ER but it may facilitate interpretation in particular in terms of inequalities.

Let us now go deeper into details to compare the groupings derived from the statistical analysis based on ER set of variables, with prototype ESeC (see table 3). The two classifications have things in common and opposite features.

Common features :

- In the two classifications, blue and white-collars workers with supervisory responsibilities do not belong to the same classes as ordinary workers. On the contrary, technicians on the one side, managers on the other belong to the same classes whatever their hierarchical position.

- Occupations in intermediate classes (class D and class 3) are very similar.

- Workers in the most repetitive occupations belong to the same class. For instance in class G as in class 9 (prototype ESeC) we have housekeeping and restaurant service workers (512), crop and animal producers (613), motor vehicle drivers (832) , domestic and related helpers, cleaners and launderers (913), messengers, porters, doorkeepers and related workers (915).

- In the classification based on cluster analysis, occupations of class A mainly belong to the private sector contrary to occupations in class B and C. Similarly, in prototype ESeC, class 1 and 2 differ not as much in terms of asset specificities, but beause of the characteristics of their employer (axis 3). In France, occupations in class 2 of ESeC are mainly located in the public sector whereas workers in class 1 are employed in the private sector. This result is not surprising since prototype ESeC was conceived to highlight employment relations. But it suggests that as regards employment regulations the distinction between private and public employers might be central in a country such as France.

Opposite features :

- In ESeC project, there is a special class designed for blue-collars supervisors which is not the case in the classification derived from cluster analysis. In fact, in the empirical classification when having more than three subordinates under their authority, blue and white collars are very similar to intermediary occupations members so that they belong to the same class. As a matter of fact, when supervising the work of more than 3 subordinates, material-recording and transport clerks (413), housekeeping and restaurant service workers (512), building frame and related trades workers (712), assemblers (828) belong to class E as well as technicians for instance.

- Among occupations theoretically assigned to prototype ESeC class 2, there are high variations in terms of employment relations. Public service administrative professionals (247), customs, tax and

related government associate professionals (344) should stand apart because they share specific employment relations whatever their supervisory status.

- Be they supervisor or not, physical and engineering science technicians (311), as well as life science technicians (321) are closer to supervisors (prototype ESeC 6) rather than to lower professionals (prototype ESeC class 2); the robustness of this result must be checked because it might depend on the definition of supervisory function and the threshold of 3 subordinates;

- In terms of employment relations, teachers belong to a specific group do they teach in college, university (231), secondary (232) or primary and pre-primary (233) education;

- Writers and creative performing artists (245), computer associate professionals (312), health associate professionals (322), and other teaching associate professionals (334) are closer to intermediate occupations (prototype ESeC 3) than to lower professionals (prototype ESeC 2).

- Two sets of occupations are grouped together in prototype ESeC class 7, though they are quite different in terms of employment relations. Material-recording and transport clerks (413), according to our analysis, cashiers, tellers and related clerks (421) and client information clerks (422) should not belong to the same class as personal care and related workers (513), other personal services workers (514), shop, stall and market salespersons and demonstrators (522). Indeed, salespersons appear closer to unskilled lower level employees, expected to belong to the group 9 of prototype ESeC; the classification of salespersons is therefore an issue to discuss;

- Occupations grouped in ESeC class 9 are also heterogeneous as regards ER. Cluster analysis suggests to put aside housekeeping and restaurant service workers (512), crop and animal producers (613), motor vehicle drivers (832), domestic and related helpers, cleaners and launderers (913), messengers, porters, doorkeepers and related workers (915).

Table 2 : Distribution of prototype ESeC classes and those resulting from cluster analysis according to ER

		Class A	Class B	Class C	Class D	Class E	Class F	Class G	Total
Prototype ESeC	Class 2	6	2	5	3	7	0	1	23
	Class 1	4	0	1	1	1	0	0	7
	Class 6	0	0	0	0	3	0	0	3
	Class 3	0	0	0	18	1	0	0	19
	Class 7	0	2	0	0	0	5	8	15
	Class 8	0	0	0	0	2	5	10	16
	Class 9	0	0	0	0	0	6	12	18
	Total	10	4	5	21	13	15	31	100
	Number	1526	628	818	3241	1997	2347	4711	15268

Reading: in the table, prototype ESeC classes are ordered so as to maximize the sum of the percentages on the diagonal

Figure 7 : Projections of prototype ESeC classes and classes resulting from cluster analysis on active variables related to employment relations

Projection on axis 1 and 2

a) Prototype ESeC classes
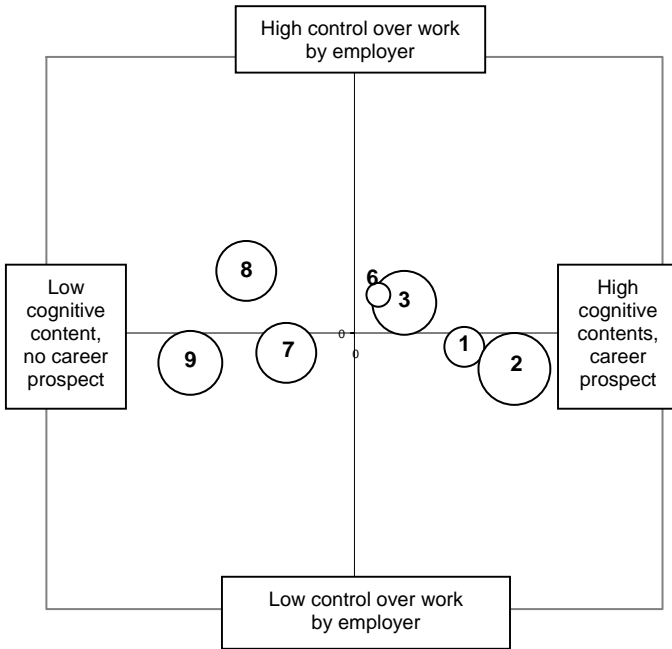
b) Classes resulting from cluster analysis
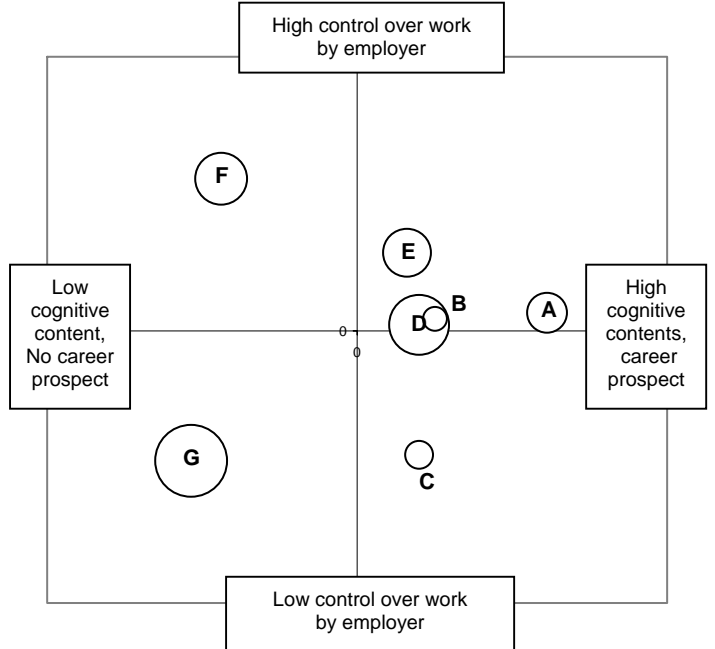
Projection on axis 3 and 4

c) Prototype ESeC classes
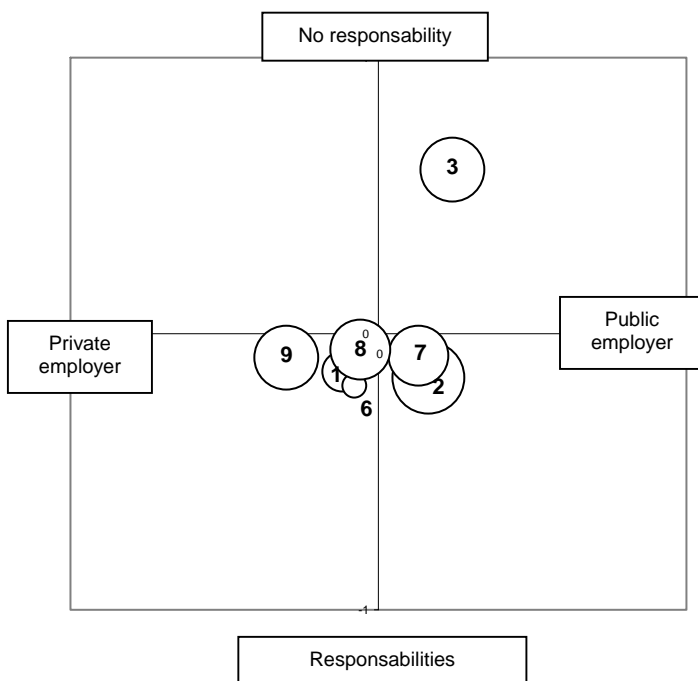
d) Classes resulting from cluster analysis
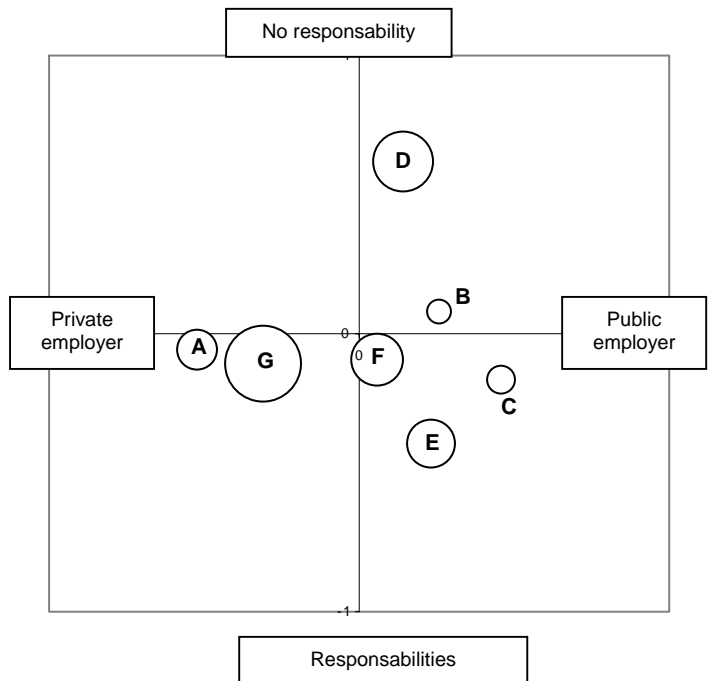
Reading: the center of gravity of classes are projected on the first two axes of components analysis
Field: Wage earners aged 15 or more, living in an ordinary household.
Sources: Working Conditions Survey, DARES, 2005 (provisional data) and Labour Force Survey 2005 , INSEE

Table 3 : Comparison between prototype ESeC and classification derived from cluster analysis on ER

		Classification derived from cluster analysis on Employment Relations						
		Class A	Class B	Class C	Class D	Class E	Class F	Class G
Prototype ESeC	Class 1	123_s 123 213_s 213 214_s 214		231	222_s 222	010_s 010		235
	Class 2	122_s 122 341_s 343_s	247_s 247 344_s 344	232 233	245 312 322 334	311 311_s 321 323 323_s		
	Class 3		412		333 341 343 346 410 411 419			
	Class 6					413_s 512_s 712_s 828_s		
	Class 7					516	413 421 422	513 514 522
	Class 8					723 724	700 721 722	611 712 713 714 741
	Class 9						414 800 812 814 815 826 827 828 833 931 932 933	512 613 832 913 915

Reading: each occupational category is represented by a rectangle whose height is proportioned to the number of wage earners is the category (except for the very small categories)
Field: Wage earners aged 15 or more, living in an ordinary household.
Sources: Working Conditions Survey 2005 and Labour Force Survey 2005, INSEE

3. **Complementary developments**

3.1 *Measuring the heterogeneity of occupations in terms of employment relations*

We deal with another aspect of the problem, which is rarely paid any attention to. In the construction process there is one hypothesis that is never assessed: are ISCO groups combined with hierarchical position homogeneous in terms of employment relationship? In this part, we try to measure the diversity in terms employment relations of employees belonging to the same ISCO sub-groups combined with supervisory status.

Multiple correspondence analysis

The multivariate analysis is carried out not on aggregated data that is to say occupations as previously but on individual data (wage earners). 15 000 wage earners are described according to exactly the same nominal variables used in part 2. The data are analysed with multiple correspondence analysis (68 active nominal variables). The objective is to synthesize the employment relationship characteristics of the sample by performing a partitioning of the 15 000 wage earners into seven homogeneous groups.

The variables which contribute the most to the making of the first factor axis are by order of decreasing importance: the fact not to have to read in the exercise of one's work, the fact not to have to write, the possibility to learn new things, total absence of complex tasks or its presence, the routine character of the work, frequent performing of unpaid overtime, in case of difficulties the recourse to a help external to the enterprise, the definition of work methods by the hierarchy, the possibility to choose one's hours the fact that the remuneration reflects efforts provided, the temporary character of work contract.

The variables which contribute the most to the constitution of the second factor axis are by decreasing contribution order: the fact that pace of work is directly checked by the hierarchy, depends on technical constraints (automatic speed of a machine or moving product) or does not depend on it , that work hours are checked by a time clock or are not at all checked, that work objectives are assessed.

The variables which contribute the most to the constitution of the third factor axis are by order of decreasing contribution: the fact to read during more than a half of one's work hours, to write during more than a half of one's work hours , to have the status of civil servant, to write during less than a half of one's time, to be under a contract of unlimited duration in private sector, to read during less than the half of one's time, not to reward one's knowledge , to be under temporary contract, the fact that the hours are checked by the hierarchy.

If some headings of ISCO are homogeneous from the point of view of employment relations others are less homogeneous. In some cases, distinction between employees carrying out management functions and the others may reduce the heterogeneousness of sub-groups of occupations as regards employment relations but it is not always the case.

Figure 8 : Correspondence analysis on individuals. Projections on the first two axes of individuals belonging to the same occupational category

Occupational categories with the smallest dispersion in terms of ER (first axis)

a) Architects, engineers, and related professionals (supervisor) (214_s)
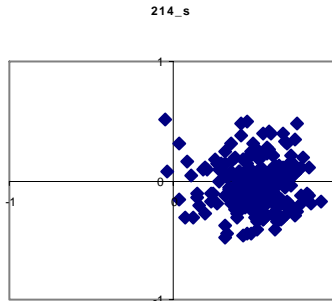
b) Public service administrative professionals (supervisor) (247_s)
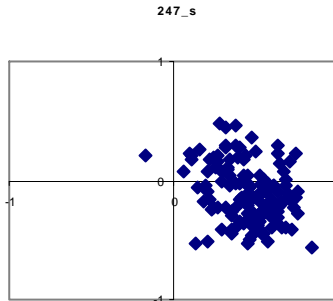
Occupational categories with the highest dispersion in terms of ER (first axis)

a) Social work associate professionals
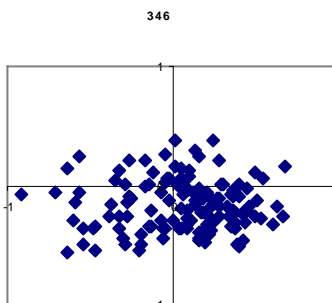
b) Housekeeping and restaurant service workers (supervisor)
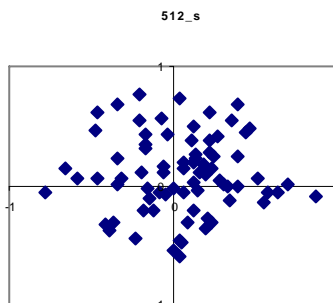
c) Market oriented crop and animal producers
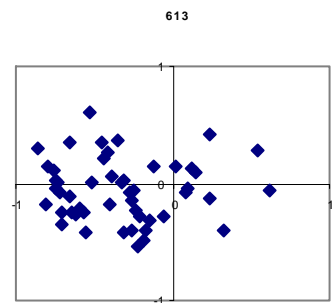
d) Craft and related trades workers
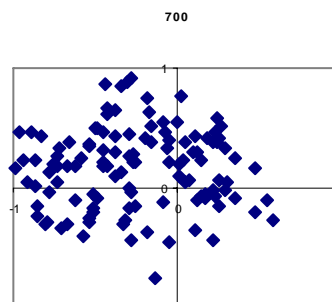
e) Domestic and related helpers, cleaners, and launderers (supervisors)
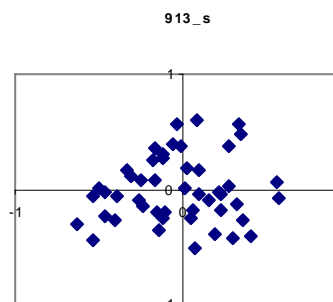
f) Manufacturing labourers
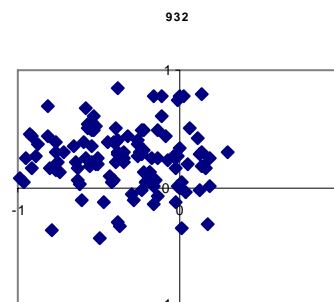
Housekeeping and restaurant service workers
(supervisor)

512_s
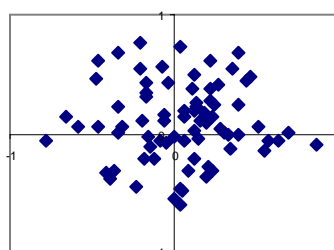
Domestic and related helpers, cleaners, and
launderers (supervisors)

913_s
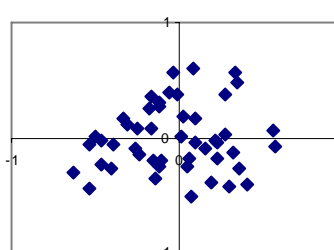
Field: Wage earners aged 15 or more, living in an ordinary household.
Sources: Working Conditions Survey 2005 and Labour Force Survey 2005, INSEE

3.2 *Classifications of occupations based on a larger set of socio-economic variables including employment relations*

The theoretical choice of considering only employment relations (formulated as a research hypothesis), however, leaves aside many other aspects of employment activity, such as the skill level required, the nature of the work performed (whether technical or administrative work, commercial or non-commercial activities), and the organisation of the work (whether according to a small-scale or industrial mode). The partial nature of the vision thus proposed is strengthened by the fact that the employment relation is concretely very broadly approached through management rank ("manager," "supervisor," etc.), whereas expertise and qualification seem to be given lesser importance.

As a matter of fact, it might no be easy to create seven groups of salaried employees only considering employment relations. This criterion has proved not be robust enough to separate social groups, at least in the case of France[15]. For lack of an indicator of competence and wages, it has been difficult to distinguish for instance medical practicioners from nurses, or among civil servants ordinary clerk from higher executive. This is why we propose testing classifications that take into account other aspects of employment situation such as the nature of the work performed (whether technical or administrative work, commercial or non-commercial activities), the organisation of the work (whether according to a small-scale or industrial mode), its hardness, the monthly wage and the skill level measured by the level of initial education (see appendix 3, page 46).

In the analysis we retain the degree obtained in initial education as a proxy for skill level. We construct three different classifications, based on different sets of information combining all these dimensions (see table 4).

Table 4 : Classifications of occupations based on different set of variables

Active variables field		Name of corresponding classification
Asset specificity	= Employment relations	**ER** (already presented)
Autonomy		
Work contract		
Employment relations + Task content and work environment		ERT
Employment relations + Task content and work environment + Wages		ERTW
Employment relations + Task content and work environment + Wages + Education		**ERTWE**

As the classification capturing employment relations set out in part 2, the new classifications are also obtained using clusters analysis (see Appendix 5 page 49). The classes are ordered according to the value

of their centroids coordinates on the first axis of principal components plan. Not surprisingly many occupations see their relative position changing according to the classification of reference.

Let's comment on the last partition which is based on the larger set of socio-economic variables and compare the position of occupations in the classification related to employment relations to their position in the classification corresponding to the larger set of variables defining job situation (ERTWE classification). Some occupations go up in the hierarchy when others go down.

For instance among ordinary employees, half of the occupations assigned to class D in classification ER are assigned to class B' in ERTWE classification: these are teaching professionals (235), health professionals (exc. nursing) (222), writers and creative performing artists (245), health associate professionals (exc. nursing) (322), special education teaching associate professionals (333), social work associate professionals (346). In the classification based on employment relations they are grouped with office clerks which is not the case in ERTWE classification because their work (mainly oriented toward public demand (patient, pupils, student) and their competences measured with the degree make them different from white-collar workers. Hadn't we considered their level of education, their relatively low wages would have positioned them in a lower group. Other occupations are classified in a higher class when we refer to ERTWE classification (based on a large set of job characteristics) rather than to ER classification. Housekeeping and restaurant service workers (512) are in this situation as well as personal care and related workers (513), other personal services workers (514), shop, stall and market salespersons and demonstrators (522), cashiers, tellers and related clerks (421). If they have precarious and subordinate employment relations as many blue-collar workers they have higher degrees, which is reflected, in the ERTWE classification.

On the opposite, numerical clerk (412), customs, tax and related government associates (344) go down in the hierarchy when education is included in the analysis. In ER nomenclature they are associated to public service administrative professionals because their employment relations bring them a high degree of security whereas in ERTWE classification they are assigned to the class of white-collar workers.

Table 5 : Classification of occupations resulting from cluster analysis (ERTWE), active variables: employment relations, task contents, wage, education

CLASS A

122_s	Production and operations managers (Supervisor)
122	Production and operations managers (Ordinary)
123_s	Other specialist managers (Supervisor)
123	Other specialist managers (Ordinary)
213_s	Computing professionals (Supervisor)
213	Computing professionals (Ordinary)
214_s	Architects, engineers and related professionals (Supervisor)
214	Architects, engineers and related professionals (Ordinary)
247_s	Public service administrative professionals (Supervisor)
247	Public service administrative professionals (Ordinary)
341_s	Finance and sales associate professionals (Supervisor)
343_s	Administrative associate professionals (Supervisor)

CLASS B

222_s	Health professionals (exc. nursing) (Supervisor)
222	Health professionals (exc. nursing) (Ordinary)
231	College, university and HE teaching professionals (Ordinary)
232	Secondary education teaching professionals (Ordinary)
233	Primary and pre-primary education teaching professionals (Ordinary)
235	Other teaching professionals (Ordinary)
245	Writers and creative performing artists (Ordinary)
322	Health associate professionals (exc. Nursing) (Ordinary)
333	Special education teaching associate professionals (Ordinary)
334	Other teaching associate professionals (Ordinary)
346	Social work associate professionals (Ordinary)

CLASS C

312	Computer associate professionals (Ordinary)
341	Finance and sales associate professionals (Ordinary)
343	Administrative associate professionals (Ordinary)
344_s	Customs, tax and related government associate professionals (Supervisor)
344	Customs, tax and related government associate professionals (Ordinary)
410	Office Clerks (Ordinary)
411	Secretaries and keyboard operators (Ordinary)
412	Numerical clerks (Ordinary)
419	Other office clerks (Ordinary)
421	Cashiers, tellers and related clerks (Ordinary)

CLASS D

010_s	Armed forces (officers) (Supervisor)
010	Armed forces (officers) (Ordinary)
311_s	Physical and engineering science technicians (Supervisor)
311	Physical and engineering science technicians (Ordinary)
321	Life science technicians and related associate professionals (Ordinary)
323_s	Nursing and midwifery associate professionals (Supervisor)
323	Nursing and midwifery associate professionals (Ordinary)
413_s	Material-recording and transport clerks (Supervisor)
512_s	Housekeeping and restaurant service workers (Supervisor)

CLASS D follow

516	Protective service workers (Ordinary)
712_s	Building frame and related trades workers (Supervisor)
723	Machinery mechanics and fitters (Ordinary)
724	Electrical and electronic equipment mechanics and fitters (Ordinary)
828_s	Assemblers (Supervisor)

CLASS E

414	Library, mail and related clerks (Ordinary)
422	Client information clerks (Ordinary)
512	Housekeeping and restaurant service workers (Ordinary)
513	Personal care and related workers (Ordinary)
514	Other personal services workers (Ordinary)
522	Shop, stall and market salespersons and demonstrators (Ordinary)
741	Food processing and related trades workers (Ordinary)
832	Motor vehicle drivers (Ordinary)
913	Domestic and related helpers, cleaners and launderers (Ordinary)
915	Messengers, porters, doorkeepers and related workers (Ordinary)

CLASS F

413	Material-recording and transport clerks (Ordinary)
700	Craft and related workers (Ordinary)
721	Metal moulders, welders, sheet-metal workers etc. (Ordinary)
722	Blacksmiths, tool makers and related trades (Ordinary)
800	Plant and machine operators and assemblers (Ordinary)
812	Metal-processing plant operators (Ordinary)
814	Wood-processing and papermaking plant operators (Ordinary)
815	Chemical-processing plant operators (Ordinary)
826	Textile, fur and leather products machine operators (Ordinary)
827	Food and related products machine operators (Ordinary)
828	Assemblers (Ordinary)
833	Agricultural and other mobile plant operators (Ordinary)
932	Manufacturing labourers (Ordinary)
933	Transport labourers and freight handlers (Ordinary)

CLASS G

611	Market gardeners and crop growers (Ordinary)
613	Crop and animal producers (Ordinary)
712	Building frame and related trades workers (Ordinary)
713	Building finishers and related trades workers (Ordinary)
714	Painters, building structure cleaners and related trades (Ordinary)
931	Mining and construction labourers (Ordinary)

Figure 9 : Tree resulting from hierarchical classification of occupations by employment relations, task contents, wage, and education
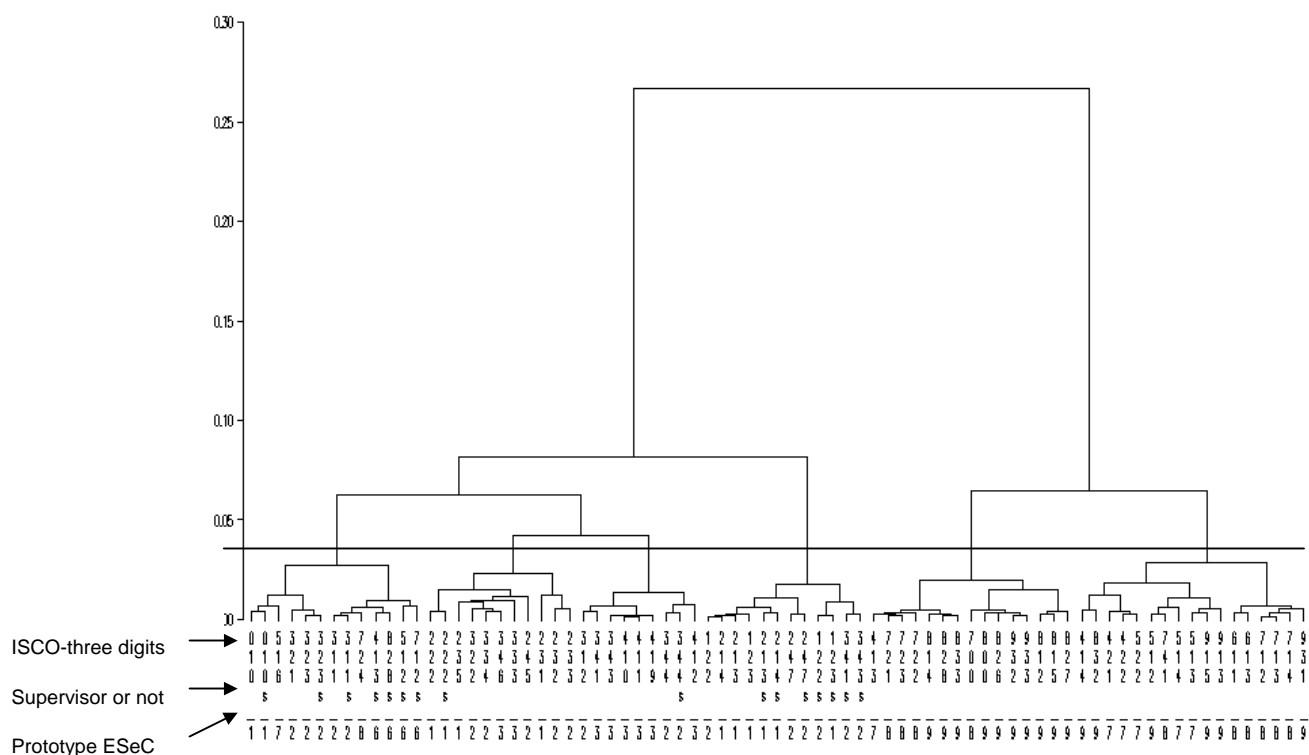
Table 6 : Distribution of prototype ESeC classes and those resulting from cluster analysis according to employment relations, task contents, work environment, wages and education

		Class A'	Class B'	Class C'	Class D'	Class E'	Class F'	Class G'	Total
	Class 1	4	2	0	1	0	0	0	7
	Class 2	7	7	1	7	1	0	0	23
	Class 3	0	2	16	1	0	0	0	19
Prototype ESeC	Class 6	0	0	0	3	0	0	0	3
	Class 7	0	0	4	0	10	1	0	15
	Class 9	0	0	0	0	12	6	0	18
	Class 8	0	0	0	2	5	5	5	16
	Total	12	10	21	13	27	12	5	100
	Number	1782	1574	3209	1997	4148	1777	781	15268

Reading: in the presentation classes are ordered so as to maximize the sum of the percentages on the diagonal

4. Conclusion: clusters analysis, a tool to develop

The method presents several advantages:

-   It compels to define precisely the criteria according to which the occupations are grouped together (for instance employment relations and/or income and/or skills).

-   It allows users to choose either a priori the number of classes or a posteriori the optimal number of classes.

-   Clusters techniques can be used if necessary to elaborate several articulated levels.

-   Graphic displays allow readers to visualize alternative classifications.

-   Graphic displays can illustrate the descriptive power of the classification in various domains (through the projection of additional variables).

Especially in an international context:

-   Cluster analysis does not require individual data taken from a unique data source and can rest on aggregated data stemming from different surveys which allows to work out the classifications through analysing a wide range of variables and countries.

-   Graphic displays allow to visualize disparities between countries

-   As ESeC prototype, classifications obtained by cluster analysis may be expressed by means of an algorithm (a derivation matrix) which for each combination of a heading of the ISCO and of employment status makes correspond a class. To compare between them the classifications, it is then sufficient to compare term to term the cells of the derivation matrices.

-    Multivariate descriptive analysis makes it easier to identify wrong coding (in an harmonized classification such as ISCO). A bad coding means an unexpected positioning on the graphs. More generally, when job titles are difficult to translate, a detail analysis of the job's characteristics may be useful.

But it has a few drawbacks

-   When it is performed on occupations and not on individuals, clusters analysis does not take into account the heterogeneity within the occupations according to the criteria retained.

-   To be implemented, these methods require large samples so that each job can be properly described.

-   It might be difficult to name the classes

References

AHRNE G. (1990), « Class and Society: A critique of John Goldthorpe's Model of Social Classes » in Clark J. and Modgil S Ed. *John Goldthorpe. Consensus and Controversy*, London: The Falmer Press, pp. 65-73.

BAUER G., JUNGBLUT J.-M., WEISS F., WIRTH H. (2006), « Issues in the Comparative Measurement of Supervisory Function », Bled Conference, 29th-30th June 2006 (not published).

BISCOURP, P. (2005), « French validation plans of the European socioeconomic classification with French statistical sources », Lisbon Conference, 19th-20th January 2006 (not published).

DESROSIÈRES A.,THÉVENOT L., (2005), *Les catégories socioprofessionnelles*, (4è éd.), Paris, La Découverte.

DEVILLE J.-C.,MALINVAUD E., (1983), « Data analysis in Official Socio-economic Statistics », *Journal of the Royal Statistical Society* Series A (General), Volume 146, Part 4, 1983.

ERIKSON R. and GOLDTHORPE JOHN H. (1992), *The Constant Flux. A Study of Class Mobility in Industrial Societies*, Oxford: Clarendon Press.

EVANS G. and MILLS C. (2000), « In search of the wage-labour/service contract: new evidence on the validity of the Goldthorpe class schema » , *British Journal of Sociology*, 51, pp. 641-661.

GOLLAC M. and VOLKOFF S. (2004), *Les conditions de travail,* La Découverte.

GOLDTHORPE JOHN H.. and HEATH A. (1992), « Revised class schema 1992 », SCPR, *Working paper* n° 13.

GOLDTHORPE JOHN H. (2000), *On Sociology, Numbers, Narratives and the Integration of Research and Theory*, Oxford University Press.

GOLDTHORPE, J.H. and MCKNIGHT, A. (2002) 'The Economic Basis of Social Class'. Oxford: Nuffield College.

GOUX D. and MAURIN E.(2001), « Social classes and employment relations », INSEE, *Working paper*, January, 2001.

GRAIS. B. (1999), *Socio-economic Classifications Used in Official Statistics of the Member States of the European Union* . Luxembourg: Eurostat.

HARRISON E. and ROSE D., *The European Socio-Economic Classification (ESeC), Draft User Guide* (February 2006), ISER, University of Essex (not published).

HOUT M., BROOKS L. and MANZA J. (1993), « The persistence of Classes in post-industrial societies », *International Sociology*, Vol 8 (3), pp. 259-277.

LEBART L., MORINEAU A. and WARWICK K.M. (1984), *Multivariate Descriptive Statistical Analysis*, John Wiley.

LE LAN R. (2005), « Analyse de données et classification sur données d'enquête, choix sur les variables, le nombre de classes et le nombre d'axes », *Journées de méthodologie statistique*, INSEE, mars 2005.

PORTE J. (1961), « Les catégories sociooccupationnelles », in *Traité de sociologie,* Friedmann G. et Naviole P. ed. Paris, Armand Colin.

ROSE, D., PEVALIN, D.J. and ELIAS, P. (with MARTIN, J.) (2001), *Towards a European Socio-economic Classification Final Report to Eurostat of the Expert Group,* London and Colchester: ONS and ISER, University of Essex.

ROSE D. and PEVALIN D., (2003), *A Researcher's Guide to the National Statistics Socio-economic Classification*, Sage Publications, LTD.

VOLKOFF S. (1987), « L'encadrement: de la catégorie statistique à la fonction exercée », Economie et Statistiques, n° 204 (pp. 30-41).

WOLFF L (2006), « Transformations of the supervisory functions since the 80's", Bled Conference, 30th June 2006 (not published).

WOLFF L. L. (2006), « Monitorat, maîtrise, administration et direction: Quatre formes du travail d'encadrement dans l'industrie », *Réseaux,* n° 214.

Appendix

APPENDIX 1: Variables related to Employment relations

Table 1 : Variables related to asset specificity

DEFINITION	NAME
Superiors decide how and when to do the job	method_fixed_hierarchy
Methods are chosen by employee	method_chosen_oneself
Tasks are repetitive	repetitive
Tasks are not repetitive	not_repetitive
The employee always solves unforseen problems on his own	solve_incident_often
It happens that the employee solves unforseen problems on his own	solve_incident_sometimes
The employee never solves unforseen problems on his own	never_solve_incident
Work cannot be interrupted freely	break_possible
Interruption of the activity is decided freely	break_not_possible
The activity is often complex	complex_often
It happens that the activity is complex	complex_sometimes
The activity is never complex	complex_never
An error in the work by the employee implies financial or security risk for the employer	financial_security_risk
An error in the activity by the employee does not imply any financial or security risk for the employer	no_financial_security_risk
More than half working time is devoted to writing	writing_often
Less than half working time is devoted to writing	writing_sometimes
For work, writing is not necessary	no_writing
More than half working time is devoted to reading	reading_often
Less than half working time is devoted to reading	reading_sometimes
For work, reading is not necessary	no_reading
The employee can be contacted after work	can_be_contacted
The employee cannot be contacted after work	can_not_be_contacted
Thanks to his/her job, the employee learns new things	new_things
In his/her job, the employee does not learn anything new	nothing_new
The employee changes post/workstation regularly or according to the needs of the company	rotation
The employee never changes post/workstation	no_rotation
In case of problems, the employee has exchanges with people outside the company	outside_help
In case of problems, the employee has no exchange with people outside the company	no_outside_help

Table 2 : Variables related to autonomy (difficulty for the employer to control the work)

DEFINITION	NAME
Time schedule is fixed by company/employer	time_schedule_employer
Within a range of possibilities fixed by company/employer, time schedule is chosen by employee	time_schedule_flexible,
Time schedule is chosen by employee	time_schedule_free
Working hours are checked by immediate superior	hours_checking_hierarchy
Working hours are checked by other means (badges, etc..)	hours_checking_other
There isn't any control over working hours	no_hours_checking
Pace of work dependent on automatic speed of a machine or a moving product or a computer	pace_machine
Pace of work does not dependent on automatic speed of a machine or a moving product or a computer	no_pace_machine
Pace of work dependent on direct control of the boss	pace_surveil
Pace of work does not dependent on direct control of the boss	no_pace_surveil
The employee complies strictly with orders	strict_application
In some cases, the employee complies strictly with orders	application_some_cases
The employee never complies with orders	no_application
In case of problems, the employee has exchanges with superiors	hierarchy_help
In case of problems, the employee has no exchanges with superiors	no_hierarchy_help
The person is director or one of his direct associates	managerial_function
The person is not director or one of his direct associates	no_managerial_function

Table 3 : Variables related to work contract

DEFINITION	NAME
Civil servant status	civil_servant
Permanent contract	permanent contract
Temporary contract (fixed term, agency contract, apprenticeship)	temporary contract
Number of years in the company /organisation inferior to 5 years	number_years_firm0
Number of years in the company /.organisation between 5 and 14 years	number_years_firm1
Number of years in the company / organisation superior to 15 years	number_years_firm2
Monthly or annual extra payments	extra_payments
No monthly or annual extra payments	no_extra_payment
The employee fears to be made redundant in the next 12 months	fear_redundancy
The employee does not fear to be made redundant in the next 12 months	no_fear_redundancy
Training paid by the employer over the past 3 months	training_employer
No training paid by the employer over the past 3 months	no_training_employer
Wage increase negative or null for the last 18 months	wage_increase0
Wage increase between between 0 and 8% for the last 18 months	wage_increase1
Wage increase superior to 8 % for the last 18 months	wage_increase2
Effort intensity has much effect on career prospect	career_prospect_high
Effort intensity has some effect on career prospect	career_prospect_low
There is no link between effort intensity and career prospect	no_career_prospect
Extra-work is often done out of the usual time schedule without compensation	extra_work_often
Sometimes extra-work is done out of the usual time schedule without compensation	extra_work_sometimes
No extra-work out of the usual time schedule without compensation	no_extra_work
The employee fears to be made redundant in the next 12 months	figured_objective
The employee does not fear to be made redundant in the next 12 months	no_figured_objective

APPENDIX 2: A few graphics illustrating ACP on employment relations variables

ACP where active variables are related to asset specificity and autonomy, projection of active observations on axis 1 and 2

a) Production and operations managers (supervisor and ordinary)

High control over work

Limited cognitive contents — 122 → 122_s — High cognitive contents

4

0

-8

4

-2

-4

No Industrial regulation
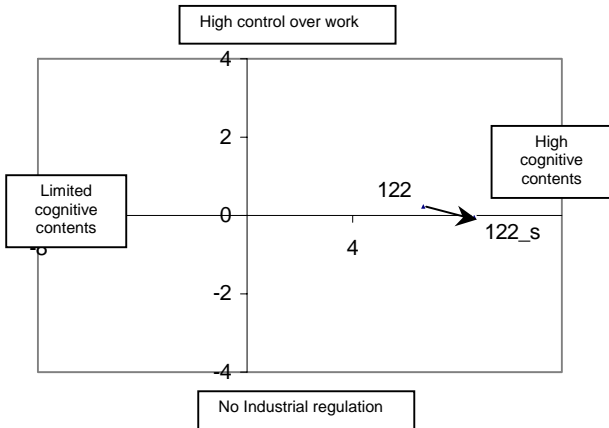
b) Health professionals (exc. nursing) (supervisor and ordinary)

Industrial regulation

Limited cognitive contents

High cognitive contents

4

2

0

-8

4 → 222_s

222

-2

-4

No Industrial regulation
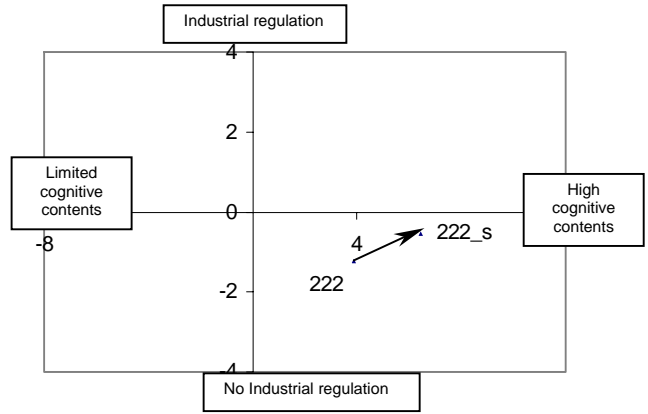
c) Finance, sales associate professionals (supervisor and ordinary)

Industrial regulation

341 → 341_s

Limited cognitive contents

High cognitive contents

4

2

0

4

-2

-4

Low control over work

d) Material-recording and transport clerks (supervisor and ordinary)

Industrial regulation

413_s

413

Limited cognitive contents

High cognitive contents

4

2

0

4

-2

-4

Low control over work
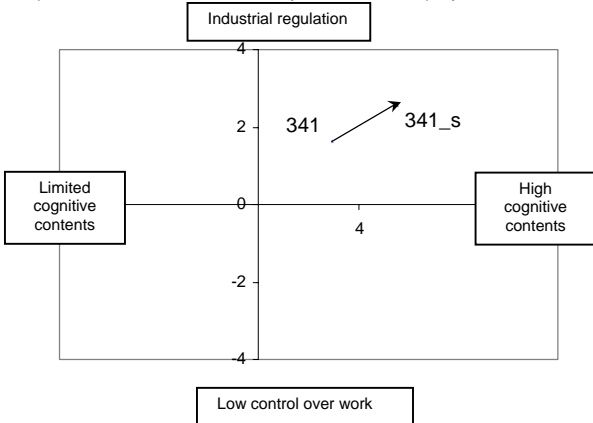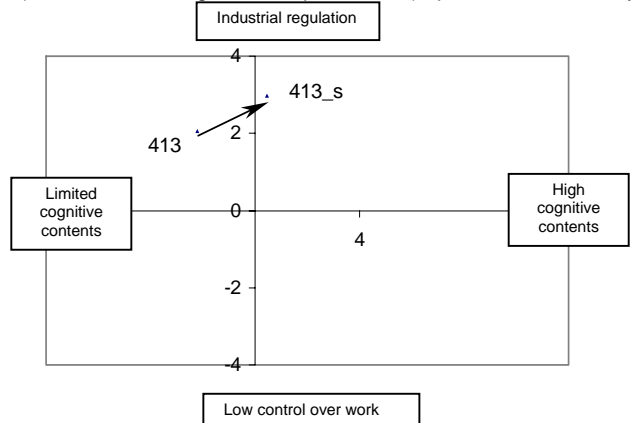
e) Housekeeping, restaurant service workers (super. and ordinary)
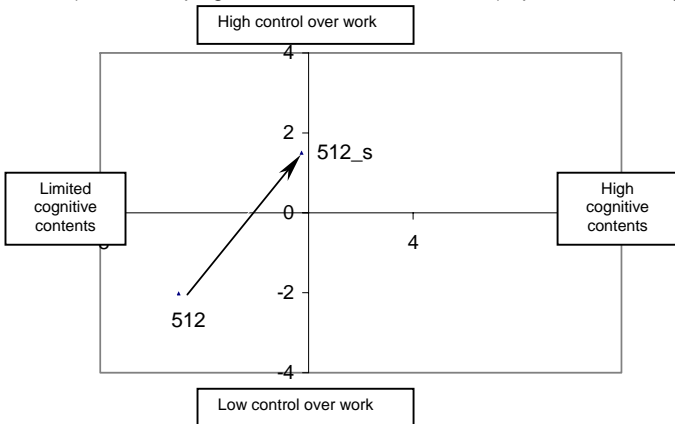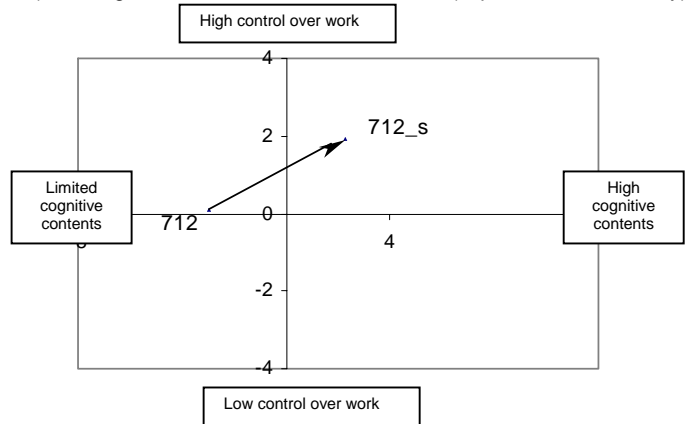
High control over work

512_s

Limited cognitive contents

High cognitive contents

4

2

0

4

-2

512

-4

Low control over work

f) Building frame and related trades workers (supervisor and ordinary)

High control over work

712_s

Limited cognitive contents

712

High cognitive contents

4

2

0

4

-2

-4

Low control over work

g) Assemblers (supervisor and ordinary)

High control over work

828 → 828_s

Limited cognitive contents

High cognitive contents

4

2

0

-8

4

-2

-4

Low control over work

h) Armed forces (supervisor and ordinary)

High control over work

010_s

.010

Limited cognitive contents

High cognitive contents

4

2

0

4

-2

-4

Low control over work
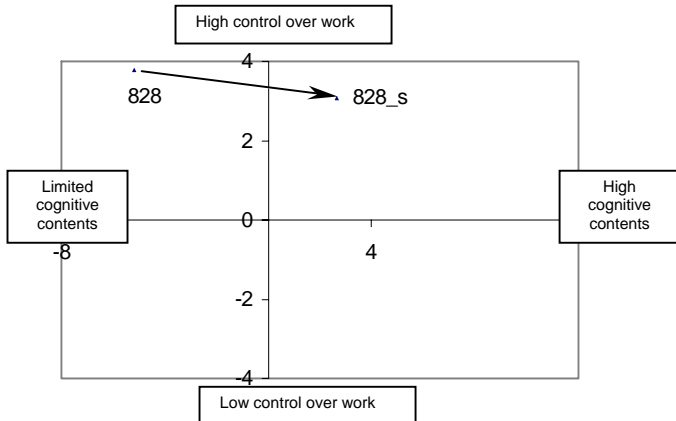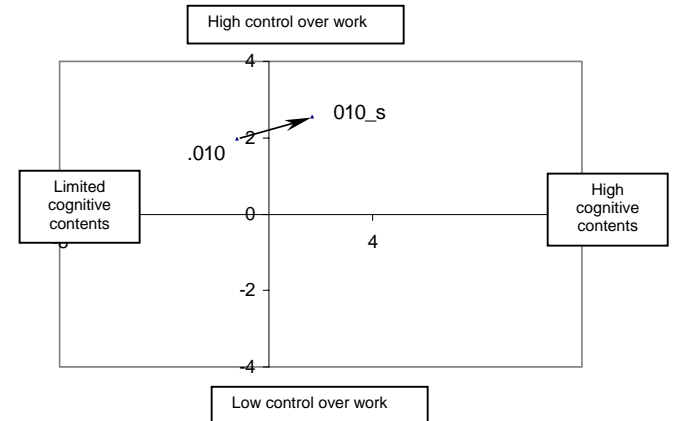
Field: Wage earners aged 15 or more, living in an ordinary household.
Sources: Working Conditions Survey, DARES, 2005 (provisional data) and Labour Force Survey 2005 , INSEE

APPENDIX 3: Variables related to Working context, Wages and level of Education

Table 1 : Variables related to task contents and working context

DEFINITION	NAME
Pace of work depends on direct demands from people (customers..) or production norms	pace_demand
Pace of work does not depend on direct demands from people (customers..) or production norms	no_pace_demand
Pace of work depends on the work done by colleagues	pace_colleague
Pace of work does not depend on the work done by colleagues	no peace colleague
The employee works on a production line	production_line
The employee does not work on a production line	no_production_line
The work implies heavy loads carrying and/or painful or tiring postures	painful
The work does not imply any heavy loads neither painful nor tiring postures	not_painful
Work environment is dirty and/or humid and/or ill-smelling and/or cold, hot, with cold-air stream, without toilets, without view	unpleasant_environment
Work environment is clean, without humidity or bad smells. Temperature is adequate, without cold-air stream. Toilets are clean	pleasant_environment
The employee deals with people that are not employees (customers, passengers, pupils, patients)	dealing_with_people
The employee does not deal with people that are not employees (customers, passengers, pupils, patients)	not_dealing_with_people
The employee uses a computer	with_computer
The employee doesn't use any computer	without_computer
The work entails risks for health	health_risk
The work does not entail any risk for health	no_health_risk
The employee has had at least one work accident in the last 12 months	accident
The employee had no work accident in the last 12 months	no_accident
The employee works in a local unit, in an establishment of the company	outside_company
The employee does not work in a local unit, in an establishment of the company	not_outside_company
Size of local unit, establishment is less than 20 employees-	employees_inf20
Size of local unit, establishment is between 20 and 200 employees-	employees_20_200
Size of the local unit, establishment is more than 200 employees	employees_sup200

Table 2 : Variables related to wages

DEFINITION	NAME
0 to 500 euros	wage1
500 to 800 euros	wage2
800 to 1250 euros	wage3
1250 to 2100 euros	wage4
2100 to 2900 euros	wage5
2900 to 4200 euros	wage6
More than 4200 euros	wage7

Table 3 : Variables related to education level

DEFINITION		NAME
cite97 in ('1..','0..')	degree1	Sans diplôme
cite97 in ('2..')	degree2	Certificat d'études primaires
cite97 in ('3A ','3B ','3CM','3CL')	degree3	CAP, BEP, Brevet des collèges
cite97='4..')	degree4	Bac général, technologique, occupationnel, brevet de technicien, brevet occupationnel
cite97 in ('5B.','5AS')	degree5	Premier cycle universitaire, DUT, BTS, paramédical et social (niveau bac+2), autre diplôme (niveau bac+2)
cite97 in ('5AM','5AL')	degree6	Licence, maîtrise
cite97 in ('6..')	degree7	Troisième cycle universitaire, écoles niveau licence et au-delà

APPENDIX 4: Employment relations according to prototype ESeC classes: descriptive results

The dimensions the more correlated with Prototype ESeC

a) Not repetitive
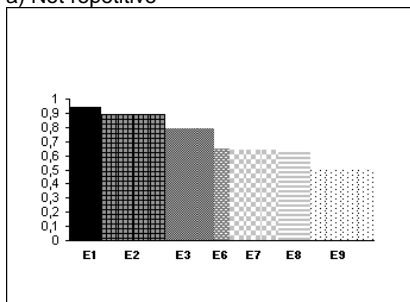
b) No reading
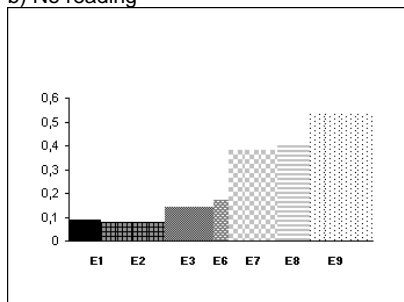
c) Strict compliance
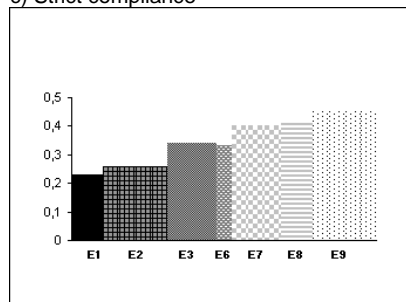
d) No hours checking
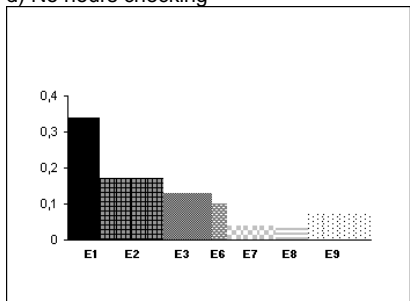
e) Training by employer
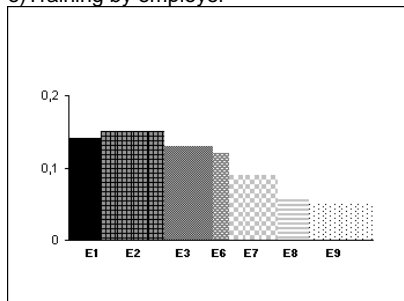
f) No extra work
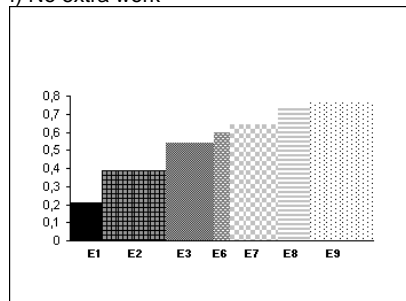
The dimensions partially correlated with ESeC

g) Often complex
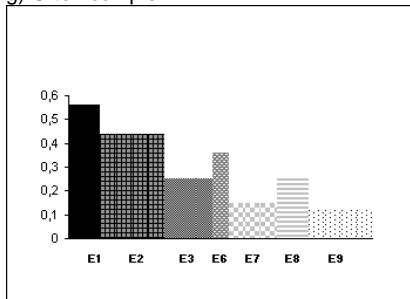
h) Writing often
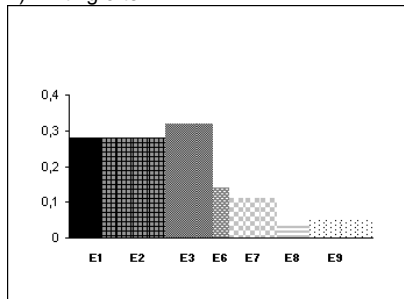
i) High carrer prospect
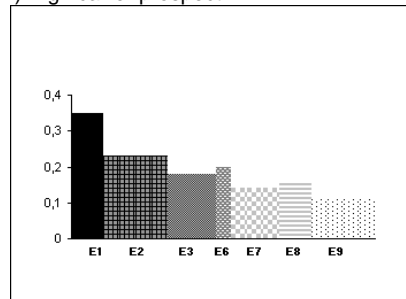
j) Time scheduled by employer
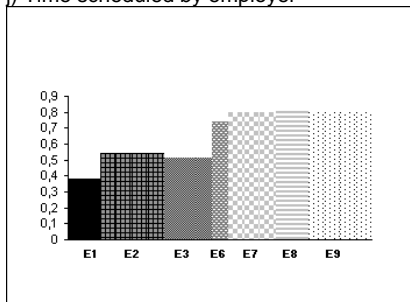
k) Temporary contract
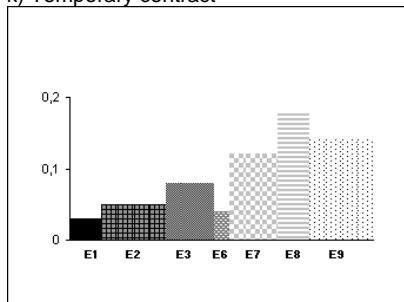
l) Fear redundancy
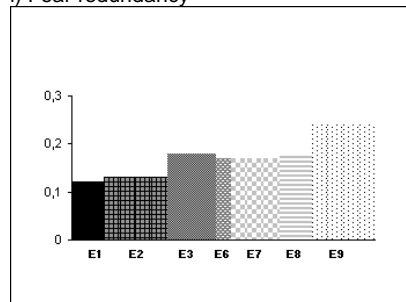
Reading: the size of a given prototype ESeC class is proportional to the surface of the rectangle which represents it.
Field: Wage earners, aged 15 or more, living in an ordinary household.
Sources: Working Conditions Survey, DARES, 2005 (provisional data) and Labour Force Survey 2005 , INSEE

p)   q) Number of years in the firm>15

The dimensions the less correlated with Prototype ESeC
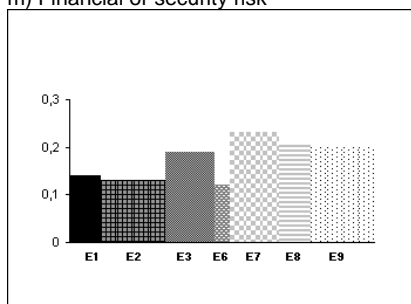
m) Financial or security risk   n) Figured objectives   o) Hours checking by hierarchy
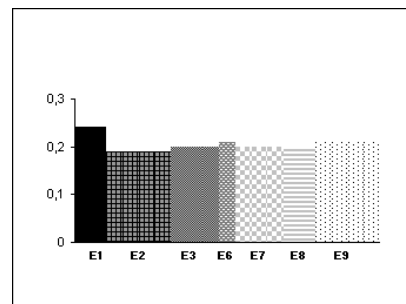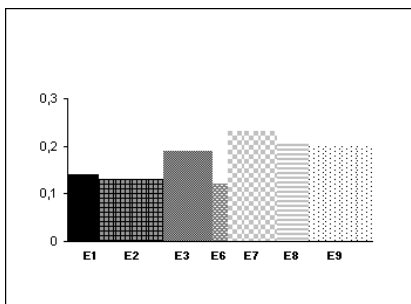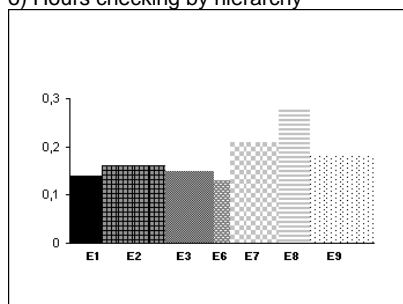
Reading: the size of a given prototype ESeC class is proportional to the surface of the rectangle which represents it.
Field: Wage earners, aged 15 or more, living in an ordinary household.
Sources: Working Conditions Survey, DARES, 2005 (provisional data) and Labour Force Survey 2005 , INSEE

APPENDIX 5: Comparison of occupational classifications according to several sets of variables

ISCO three digits

Group	Code	Description
0	010_s	Armed forces (officers) (Supervisor)
	010	Armed forces (officers) (Ordinary)
1	122_s	Production and operations managers (Supervisor)
	122	Production and operations managers (Ordinary)
	123_s	Other specialist managers (Supervisor)
	123	Other specialist managers (Ordinary)
2	213_s	Computing professionals (Supervisor)
	213	Computing professionals (Ordinary)
	214_s	Architects, engineers and related professionals (Supervisor)
	214	Architects, engineers and related professionals (Ordinary)
	222_s	Health professionals (exc. nursing) (Supervisor)
	222	Health professionals (exc. nursing) (Ordinary)
	231	College, university and HE teaching professionals (Ordinary)
	232	Secondary education teaching professionals (Ordinary)
	233	Primary and pre-primary education teaching professionals (Ordinary)
	235	Other teaching professionals (Ordinary)
	245	Writers and creative performing artists (Ordinary)
	247_s	Public service administrative professionals (Supervisor)
	247	Public service administrative professionals (Ordinary)
3	311_s	Physical and engineering science technicians (Supervisor)
	311	Physical and engineering science technicians (Ordinary)
	312	Computer associate professionals (Ordinary)
	321	Han (Ordinary)
	322	Health associate professionals (exc. Nursing) (Ordinary)
	323_s	Nursing and midwifery associate professionals (Supervisor)
	323	Nursing and midwifery associate professionals (Ordinary)
	333	Special education teaching associate professionals (Ordinary)
	334	Other teaching associate professionals (Ordinary)
	341_s	Finance and sales associate professionals (Supervisor)
	341	Finance and sales associate professionals (Ordinary)
	343_s	Administrative associate professionals (Supervisor)
	343	Administrative associate professionals (Ordinary)
	344_s	Customs, tax and related government associate professionals (Supervisor)
	344	Customs, tax and related government associate professionals (Ordinary)
	346	Social work associate professionals (Ordinary)
4	410	Office Clerks (Ordinary)
	411	Secretaries and keyboard operators (Ordinary)
	412	Numerical clerks (Ordinary)
	413_s	Material-recording and transport clerks (Supervisor)
	413	Material-recording and transport clerks (Ordinary)
	414	Library, mail and related clerks (Ordinary)
	419	Other office clerks (Ordinary)
	421	Cashiers, tellers and related clerks (Ordinary)
	422	Client information clerks (Ordinary)
5	512_s	Housekeeping and restaurant service workers (Supervisor)
	512	Housekeeping and restaurant service workers (Ordinary)
	513	Personal care and related workers (Ordinary)
	514	Other personal services workers (Ordinary)
	516	Protective service workers (Ordinary)
	522	Shop, stall and market salespersons and demonstrators (Ordinary)
6	611	Market gardeners and crop growers (Ordinary)
	613	Crop and animal producers (Ordinary)
7	700	Craft and related workers (Ordinary)
	712_s	Building frame and related trades workers (Supervisor)
	712	Building frame and related trades workers (Ordinary)
	713	Building finishers and related trades workers (Ordinary)
	714	Painters, building structure cleaners and related trades (Ordinary)
	721	Metal moulders, welders, sheet-metal workers etc. (Ordinary)
	722	Blacksmiths, tool makers and related trades (Ordinary)
	723	Machinery mechanics and fitters (Ordinary)
	724	Electrical and electronic equipment mechanics and fitters (Ordinary)
	741	Food processing and related trades workers (Ordinary)
8	800	Plant and machine operators and assemblers (Ordinary)
	812	Metal-processing plant operators (Ordinary)
	814	Wood-processing and papermaking plant operators (Ordinary)
	815	Chemical-processing plant operators (Ordinary)
	826	Textile, fur and leather products machine operators (Ordinary)
	827	Food and related products machine operators (Ordinary)
	828_s	Assemblers (Supervisor)
	828	Assemblers (Ordinary)
	832	Motor vehicle drivers (Ordinary)
	833	Agricultural and other mobile plant operators (Ordinary)
9	913	Domestic and related helpers, cleaners and launderers (Ordinary)
	915	Messengers, porters, doorkeepers and related workers (Ordinary)
	931	Mining and construction labourers (Ordinary)
	932	Manufacturing labourers (Ordinary)
	933	Transport labourers and freight handlers (Ordinary)

Employment relations

- **A**: 122_s, 122, 123_s, 123, 213_s, 213, 214_s, 214, 341_s, 343_s, 247_s, 247
- **B**: 344_s, 344, 412, 231
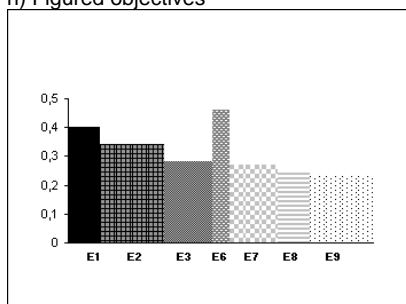- **C**: 232, 233, 222_s, 222, 245, 312, 322, 333, 334, 341
- **D**: 343, 346, 410, 411, 419, 010_s, 010, 311_s, 311, 321, 323_s
- **E**: 323, 413_s, 512_s, 516, 712_s, 723, 724, 828_s, 413, 414, 421, 422, 700, 721, 722, 800, 812
- **F**: 814, 815, 826, 827, 828, 833, 931, 932, 933, 235, 512, 513, 514, 522
- **G**: 611, 613, 712, 713, 714, 741, 832, 913, 915

PLUS TASK CONTENTS

122_s, 122, 123_s, 123, 213_s, 213, 214_s, 214, 247_s, 247, 312, 341_s, 341, 343_s, 344_s, 222_s, 222, 231, 232, 233, 235, 245, 322, 333, 334, 346, 343, 344, 410, 411, 412, 419, 421, 422, 522, 010_s, 010, 321, 323_s, 323, 516, 311_s, 311, 413_s, 413, 414, 512_s, 712_s, 723, 724, 828_s, 700, 721, 722, 800, 812, 814, 815, 826, 827, 828, 833, 932, 933, 512, 513, 514, 611, 613, 712, 713, 714, 741, 832, 913, 915, 931

PLUS WAGE

122_s, 122, 123_s, 123, 213_s, 213, 214_s, 214, 247_s, 341_s, 343_s, 247, 312, 341, 343, 344_s, 344, 410, 411, 412, 419, 421, 222_s, 222, 231, 232, 233, 235, 245, 322, 333, 334, 346, 010_s, 010, 311_s, 311, 321, 323_s, 323, 413_s, 512_s, 516, 712_s, 723, 724, 828_s, 611, 613, 712, 713, 714, 931, 413, 700, 721, 722, 800, 812, 814, 815, 826, 827, 828, 833, 932, 933, 414, 422, 512, 513, 514, 522, 741, 832, 913, 915

PLUS EDUCATION

- **A'**: 122_s, 122, 123_s, 123, 213_s, 213, 214_s, 214, 247_s, 247, 341_s, 343_s
- **B'**: 222_s, 222, 231, 232, 233, 235, 245, 322, 333, 334, 346, 312
- **C'**: 341, 343, 344_s, 344, 410, 411, 412, 419, 421
- **D'**: 010_s, 010, 311_s, 311, 321, 323_s, 323, 413_s, 512_s, 516, 712_s, 723, 724, 828_s, 414, 422, 512
- **E'**: 513, 514, 522, 741, 832
- **F'**: 913, 915, 413, 700, 721, 722, 800, 812, 814, 815, 826, 827, 828, 833, 932, 933
- **G'**: 611, 613, 712, 713, 714, 931

APPENDIX 6: Derivation matrix: prototype ESeC and classifications obtained with cluster analysis

	Prototype ESeC			Classification of wage earners occupations according to employment relations			Classification of wage earners occupations according to employment relations, task content, work environment, wages, and education	
ISCO(COM)-88 minor groups	Supervisor	Not supervisor	ISCO(COM)-88 minor groups	Supervisor	Not supervisor	ISCO(COM)-88 minor groups	Supervisor	Not supervisor
010	1	1	010	E	E	010	D'	D'
122	2	2	122	A	A	122	A'	A'
123	1	1	123	A	A	123	A'	A'
213	1	1	213	A	A	213	A'	A'
214	1	1	214	A	A	214	A'	A'
222	1		222	D	D	222	B'	B'
231		1	231	.	C	231	.	B'
232		2	232	.	C	232	.	B'
233		2	233	.	C	233	.	B'
235		1	235	.	G	235	.	B'
245		2	245	.	D	245	.	B'
247	2	2	247	B	B	247	A'	A'
311	2	2	311	E	E	311	D'	D'
312		2	312	.	D	312	.	C'
321		2	321	.	E	321	.	D'
322		2	322	.	D	322	.	B'
323	2	2	323	E	E	323	D'	D'
333		3	333	.	D	333	.	B'
334		2	334	.	D	334	.	B'
341	2	3	341	A	D	341	A'	C'
343	2	3	343	A	D	343	A'	C'
344	2	2	344	B	B	344	C'	C'
346		3	346	.	D	346	.	B'
410		3	410	.	D	410	.	C'
411		3	411	.	D	411	.	C'
412		3	412	.	B	412	.	C'
413	6	7	413	E	F	413	D'	F'
414		9	414	.	F	414	.	E'
419		3	419	.	D	419	.	C'
421		7	421	.	F	421	.	C'
422		7	422	.	F	422	.	E'
512	6	9	512	E	G	512	D'	E'
513		7	513	.	G	513	.	E'
514		7	514	.	G	514	.	E'
516		7	516	.	E	516	.	D'
522		7	522	.	G	522	.	E'
611		8	611	.	G	611	.	G'
613		9	613	.	G	613	.	G'
700		8	700	.	F	700	.	F'
712	6	8	712	E	G	712	D'	G'
713		8	713	.	G	713	.	G'
714		8	714	.	G	714	.	G'
721		8	721	.	F	721	.	F'
722		8	722	.	F	722	.	F'
723		8	723	.	E	723	.	D'
724		8	724	.	E	724	.	D'
741		8	741	.	G	741	.	E'
800		9	800	.	F	800	.	F'
812		9	812	.	F	812	.	F'
814		9	814	.	F	814	.	F'
815		9	815	.	F	815	.	F'
826		9	826	.	F	826	.	F'
827		9	827	.	F	827	.	F'
828	6	9	828	E	F	828	D'	F'
832		9	832	.	G	832	.	E'
833		9	833	.	F	833	.	F'
913		9	913	.	G	913	.	E'
915		9	915	.	G	915	.	E'
931		9	931	.	F	931	.	G'
932		9	932	.	F	932	.	F'
933		9	933	.	F	933	.	F'

APPENDIX 7: Classification of individuals derived from clusters analysis on ER

The classification described here has been carried out not on aggregated data (occupations) as previously but on individual data (wage earners). We have carried out a partition into 7 groups in order to compare it to the prototype ESeC on the one hand and with the classification resulting from cluster analysis on occupations on the other. The description of the groups constitutes a summary of employment relations of the data[16].

The seven groups are the following:

First group (18%)

The wage earners of this first group are distinct from the others on several respects. They enjoy a relative autonomy. They are less numerous to benefit from the help of a supervisor and they solve more often the incidents by themselves. The limits of the work of these wage earners are defined in specific periods. Among these wage earners scarce are those who are contacted by the employer out of work hours. On the other hand, during work hours they cannot interrupt their activity. Lastly, the employer is engaged in a short-term relationship with these wage earners, who benefit more scarcely than the others from training and whose remuneration and promotions are little sensitive to the efforts carried out.

This group includes :

- 65% of domestic and related helpers, cleaners and launderers (Ordinary)	(913)
- 50% of painters, building structure cleaners and related trades (Ordinary)	(714)
- 45% of food processing and related trades workers (Ordinary)	(741)
- 44% of personal care and related workers (Ordinary)	(513)
- 41% of housekeeping and restaurant service workers (Ordinary)	(512)
- 41% of market gardeners and crop growers (Ordinary)	(611)
- 40% of messengers, porters, doorkeepers and related workers (Ordinary)	(915)
- 34% of crop and animal producers (Ordinary)	(613)
- 28% of building frame and related trades workers (Ordinary)	(712)
- 27% of motor vehicle drivers (Ordinary)	(832)
- 25% of shop, stall and market salespersons and demonstrators (Ordinary)	(522)

Second group (18%)

The wage earners of this group have characteristics that on several respects set them in an intermediate position. If in the framework of their work, they need to read documents and to write texts, scarce are those who devote to these activities more than a half of their work hours. They enjoy a relative freedom in the organisation of their work hours. They choose their hours in a framework pre-defined by the employer and they have the possibility to interrupt their work when they wish. Under some situations, they must follow strict instructions but it is not always the case. As a rule, they choose by themselves their work methods. They are not imposed assessed objectives. If the hierarchy is present it is more to bring help when necessary than to check the pace of work. It happens to them sometimes to have to perform complex tasks. These wage earners find their work is rewarding and little routine. In majority employees with an unlimited duration contract in private sector, their career is not without prospects: in some measure, their efforts can award them a promotion or a salary rise.

This group includes :

- 54 % of numerical clerks (Ordinary)	412
- 39% of physical and engineering science technicians (Ordinary)	311
- 39% of computer associate professionals (Ordinary)	312
- 36 % of customs, tax and related government associate professionals (Ordinary)	344
- 34% of other office clerks (Ordinary)	419
- 34% of office Clerks (Ordinary)	410
- 33% of administrative associate professionals (Ordinary)	343
- 33% of physical and engineering science technicians (Supervisor)	311_s
- 32% of customs, tax and related government associate professionals (Supervisor)	344_s
- 32% of material-recording and transport clerks (Supervisor)	413_s

---

[16] The computations could have not been done on the raw data each individual by his or her responses to active variables because there is an advantage in characterizing them by their first coordinates obtained from the multiple correspondence analysis, distance calculations between individuals are far easier to execute if there are restricted to the first axes of an analysis, when the observations are contained in a higher dimensional space.

- 28% of life science technicians and related associate professionals (Ordinary	321
- 28% of secretaries and keyboard operators (Ordinary)	411

Third group (12%)

Nearly all the wage earners of this group devote more than a half of their occupational activity to complex tasks implying reading and writing of documents. Nearly all of them mention the rewarding and little routine character of their work as well as the autonomy they benefit from including in the choice of their work methods. In case of difficulties, they bring solutions by themselves. They have a little more liberty than the other wage earners in the choice of their work hours but it happens to them very often to work without salary compensation out of usual hours. The proportion of civil servants is a little more important in this group than in the rest of the population and the share of short duration contracts is markedly lower.

This group includes :

- 30% of health professionals (exc. nursing) (Supervisor)	(222_s)
- 39% of public service administrative professionals (Ordinary)	(247)
- 18% of other teaching associate professionals (Ordinary)	(334)

Fourth group (14%)

The three quarters of the wage earners of this group have a routine work the pace of which, given by technical constraints is checked by a hierarchy (other checking other) which sets quantitative objectives and determines work hours. It happens scarcely to them to solve by themselves the problems they encounter. An error from them may lead to financial loss for the enterprise or health risks. A rotation of workstations is often proposed to them. Most of them benefit from an unlimited duration contract in private sector. These wage earners have a little higher seniority than the others, which does not prevent them to fear a layoff. They are numerous to receive annual or monthly bonuses. They scarcely perform overtime without salary compensation.

This group includes :

- 73% of metal-processing plant operators (Ordinary)	(812)
- 70% of food and related products machine operators (Ordinary)	(827)
- 63% of chemical-processing plant operators (Ordinary)	(815)
- 52% of wood-processing and papermaking plant operators (Ordinary)	(814)
- 47% of assemblers (Ordinary)	(828)
- 44% of manufacturing labourers (Ordinary)	(932)
- 43% of textile, fur and leather products machine operators (Ordinary)	(826)
- 43% of blacksmiths, tool makers and related trades (Ordinary)	(722)
- 40% of library, mail and related clerks (Ordinary)	(414)
- 39% of agricultural and other mobile plant operators (Ordinary)	(833)
- 37% of plant and machine operators and assemblers (Ordinary)	(800)
- 34% of craft and related workers (Ordinary)	(700)
- 33% of metal moulders, welders, sheet-metal workers etc. (Ordinary)	(721)
- 29% of material-recording and transport clerks (Ordinary)	(413)
- 29% of cashiers, tellers and related clerks (Ordinary)	(421)
- 27% of housekeeping and restaurant service workers (Supervisor)	(512_s)
- 26% of machinery mechanics and fitters (Ordinary)	(723)

Fifth group (15%)

This group is made up for two thirds of civil servants. Writing and reading text is an integrating part of their activity; they devote to it less than half of their time. Their work is not routine and provides them with the occasion to reward their knowledge. Pace of work is not given by technical constraints (automatic speed of a machine or moving a product). But scarce are those who have the possibility to interrupt their work. As a rule, the hours of these wage earners are decided by the employer and checked by the hierarchy. But they can be called for out of usual work hours. These wage earners are not compelled to reach assessed objectives. Remuneration and promotion are not linked to the intensity of efforts provided. With seniority a little higher than the average, these wage earners are not threatened by unemployment.

This group includes :

- 65% of primary and pre-primary education teaching professionals (Ordinary)	233
- 60% of protective service workers (Ordinary)	516
- 57% of secondary education teaching professionals (Ordinary)	232

- 53% of nursing and midwifery associate professionals (Ordinary)   323
- 53% of nursing and midwifery associate professionals (Supervisor)   323_s
- 51% of armed forces (officers) (Supervisor)   010_s
- 45% of armed forces (officers) (Ordinary)   010_s
- 45% of health professionals (exc. nursing) (Ordinary)   222
- 45% of college, university and HE teaching professionals (Ordinary)   231
- 42% of other teaching professionals (Ordinary)   235
- 33% of office Clerks (Ordinary)   410
- 29% of special education teaching associate professionals (Ordinary)   333
- 28% of social work associate professionals (Ordinary)   346

Sixth group (9%)

These wage earners are distinct from the others because they are employed in the framework of a work contract of short duration (CDD, seasonal contract, interim, training period, helped employment). They have a low seniority in their enterprise and do not receive any bonuses. More than a half fear to be laid off. The hierarchy than for the other wage earners twice more often exercises the checking of the hours of these wage earners. The hierarchy defines the methods and the order under which the tasks are to be carried out. They are never asked to solve the problems by themselves. For more than a half of them the work does not call for writing. Routine, their occupational activity implies no complex task. They never work out of usual hours without salary compensation. Their occupational prospects are very limited: they have influence neither on their remuneration nor on the progress of their career. Only a very small number has benefited from a training paid for by the employer.

This group includes :

- 24% of writers and creative performing artists (Ordinary)   245
- 22% of client information clerks (Ordinary)   422
- 34% of other personal services workers (Ordinary)   514
- 24% of building finishers and related trades workers (Ordinary)   713
- 35% of mining and construction labourers (Ordinary)   931
- 31% of transport labourers and freight handlers (Ordinary)   933

Seventh group (13%)

More than a half of the wage earners of this group choose freely their work hours, they undergo no checking of their work time, and they may interrupt their work when they wish. They are set assessed objectives. They perform overtime without any financial compensation. They may be contacted out of usual work hours. The employer rewards the efforts accomplished with salary rises or a promotion, which opens to these wage earners good career prospects. They perform more complex tasks than the other wage earners, which lead many of them to request the help of persons external to the enterprise. They solve the incidents by themselves. Their errors may have important consequences at financial or human level. Their work allows them to learn new things but if it rests on writing these wage earners devote less than the half of the day to this activity.

This group includes :

- 73% of computing professionals (Supervisor)   213_s
- 69% of other specialist managers (Supervisor)   123_s
- 66% of architects, engineers and related professionals (Supervisor)   214_s
- 64% of production and operations managers (Supervisor)   122_s
- 51% of architects, engineers and related professionals (Ordinary)   214
- 49% of computing professionals (Ordinary)   213
- 45% of production and operations managers (Ordinary)   122
- 42% of finance and sales associate professionals (Supervisor)   341_s
- 42% of des occupations intermédiaires du travail social ayant des fonctions d'encadrement   346_s
- 41% of public service administrative professionals (Supervisor)   247_s
- 37% of other specialist managers (Ordinary)   123
- 36% of administrative associate professionals (Supervisor)   343_s
- 35% of des ouvriers du bâtiment (finitions) et assimilés ayant des fonctions des d'encadrement   713_s
- 32% of finance and sales associate professionals (Ordinary)   341

Does employment regulation depend on the type of work involved?

The partition into 7 groups brings well to the fore the link between types of contract and nature of the tasks accomplished. Four groups reflect particularly well this correspondence. The workers of industry are in majority employed under contracts of unlimited duration in private sector (group 4), the managers are also in that case but contrary to workers they are engaged in a long term relationship with their employer (training) and they benefit from a large autonomy. The intermediate occupations are distributed into two groups relatively distinct depending on whether they are oriented toward non-market service activities (health, education, protection) or toward market and technical activities. The wage earners of the first group have a status of civil servant, the second have a long duration contract in private sector.

But there exists two other groups for which the link between type of occupations and contract is less present. They are the low skilled occupations exercised out of industry and large distribution sector (craft industry, construction, upkeep, personal services). From the point of view of the tasks and occupational environment, the workers and employees who carry out these occupations have points in common. They are entrusted tasks that require little skills but they benefit from a relative autonomy (in comparison with workers of industrial type in particular). But the legal situation of these wage earners is very variable: the most precarious are under a temporary contract and hence belong to group 6 whereas the others may come under an unlimited duration contract (workers of the construction sector, personal services) or belong to civil service (nursing auxiliary, upkeep agent, caretaker). They are then classified in group 1, whereas they carry out a trade in every point similar to the one of the wage earners of group 6.

In fact the partition shows several configurations linking status and occupation

Links between employment status and occupations		
Strong	Middle	Low
Managers in the private sector (group 7)	Intermediate occupations in health education, civil protection	wage earners under temporary contracts (group defined by work contract)
Workers of industry, employees of large distribution (group 4)	Intermediate occupations in technical domains or in enterprise management	Wage earners performing a little skilled activity in a non-industrial framework (group defined by the occupation) (qualification, work organisation).

One also observes that in the French context according to Goldthorpe hypotheses the precariousness of the wage earners is not mechanically linked to the more or less routine character of the tasks or to the fact that they be easily checkable by the employer. Thus industry and great distribution workers are concerned about their occupational future. They know a quite as important precariousness as the workers of other sectors but it takes a different form. If they still benefit in majority from long duration contracts, they feel their employment is threatened by delocalization or technical progress, which is less the case for the workers and the employees of the sectors richer in labour force and less easily delocalized (construction, personal service, agriculture, commercial craft industry).

PART TWO

TRANSFORMATIONS OF THE SUPERVISORY FUNCTIONS SINCE THE 80'S

Loup WOLFF

DARES
39-43, quai André Citroën
75902 - PARIS CEDEX 15
FRANCE

CREST-INSEE
18 boulevard Adolphe Pinard
75 675 PARIS
FRANCE

Underlying the ESeC prototype, John Goldthorpe's theoretical framework of the "employment relationship" puts the supervisory functions at the core of its classification principles[17]. Occupying a supervisory position is in this perspective a sign of a higher position than the one given by the scale deriving in the first place from the ISCO classification. ESeC prototype is then operating in two successive steps:

1. Through a derivation matrix, ISCO professions are classified into nine classes, reflecting the "employment relationship" framework;
2. In some of these classes, the individuals that declare being supervising are reassigned into higher positions in the ESeC scale. This re-classification leads to the reassignment of "lower grade white collar workers", "skilled workers" and "semi- or non-skilled workers" into "higher grade blue collar workers", and "higher grade white collar workers" into "lower salariat". The "higher salariat" class is not affected by this second step.

Graph 1: Classification principles in ESeC prototype
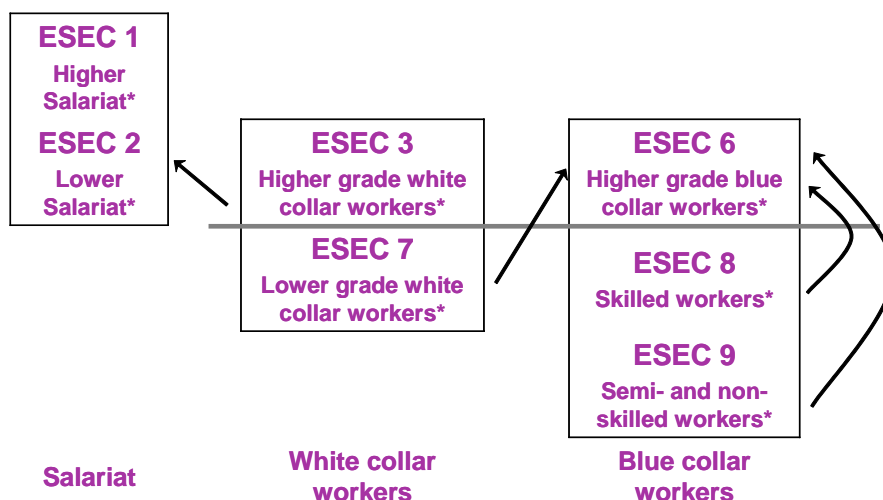
Source of the names (*): Eric Harrison and David Rose, The European Socio-economic Classification (ESeC), Draft User Guide (Essex University, February 2006).
Reading: The scales refer to the reallocation movements of individuals occupying supervisory positions.

Such a strong assumption within the construction of a socio-economic classification should be carefully examined. In fact, some long-term trends within the French society could undermine the accuracy of this theoretical choice. The devaluation of supervisory positions, which are in this model treated "by default" as valorised, could lead to a growth of the blurring in the classification.

In chapter 10 of "On Sociology, Numbers, Narratives and the Integration of Research and Theory", John Goldthorpe [2000] examines the main criticisms raised against his theoretical framework. Indeed, some authors argue that, during the three last decades, the development of organisational and technological devices at a rapid pace has deeply changed the work practices at all company levels. Boosted by neo-management practices and by the diffusion of communication and information technologies (TIC), a relatively recent trend would consist of using network patterns in order to organise work ("project management", "quality circles"...). This results in the development and increased sophistication of supervising devices which are combining commercial and industrial constraints, until then usually separated (See M. Gollac and S. Volkoff [2000]). The increasing formalisation of the production processes as well as the standardisation of work combined with the explosion of the data-processing capacities of treatment and transmission of information are the technological and organisational conditions which allowed the development in many companies of a steering of work through technological devices. Control is exerted less and less directly on *work such as it is done*, but on the procedures and the result of work themselves – assessed with an array of standardised measures (times, added value, quality standards...). New forms of supervision thus tend to throw a discredit upon the traditional functions related to hierarchical supervision, and are often associated with a bureaucratic connotation and organisational rigidity.

---

[17] This note is a short statement of various papers, originally written in French. For more developments on the results of this research, please refer to Wolff [2005] and Wolff [2006]. I would like to thank here Laurence Coutrot for her suggestions and her help in translating this work.

The fast adoption of these innovations would have resulted in a multiplication and increased complexity of the forms of supervision and in the blurring of the distinction – as John Goldthorpe stands it – between "labour contract" and "service relationship". But as he notes it himself, few empirical studies can be mobilised to illustrate such developments.

This paper aims at proposing some empirical evidence of these innovations in the French case. The re-configuration of the social properties of the employees declaring "to have one or more people under [their] orders or [their] authority" – by convention, we will name them "supervisors" in the following pages – allows us to question these hypotheses.

1. Different forms of supervision in industry

The COI Survey ('Organisational Change and ICT Use' survey) of 1997 provides a particularly rich and detailed view of work characteristics in industry for companies of twenty employees and over, and more specifically concerning collective organization of work. Rarely developed in statistical surveys, this information allows an approach of the technical and organisational devices of work supervision.

Through this survey, it is then possible to identify those employees that declare "having one or more people under their orders or their authority". It is also possible to describe a little further the characteristics of the supervisory tasks through specific questions. Based on such a rich piece of information, we intend to depict the various aspects of the hierarchical functions and to test the assumption of a division of the supervisory tasks.

1.1 Heterogeneity of supervisors

In industry, the population of employees declaring having "one or more people under [their] orders or [their] authority" is far from being limited to the "cadres" (French category corresponding to the Anglo-Saxon executives): supervisors are not only more numerous than the "cadres" (more than one employee out of four, whereas the "cadres" represent only 5,1 % of the total population), they are represented at all skill levels. The three categories of employees which count the highest number of supervisors are the foremen-agents of control (85,9 %), the administration and commercial executives (78,2 %) and finally the engineers and technical experts (69,4 %). It is mostly among categories traditionally related to the function of supervision that the odds to declare to supervise are highest.

On the other hand, even though a small proportion among skilled blue collar workers declares to be in hierarchical position (14,8 % state to assume such responsibilities), they however represent a significant part of all supervisors: almost one employee declaring to supervise out of five is a skilled blue collar worker. More generally, more than one supervisor out of four in industry takes part in supervisory activities (blue or white collar worker). A significant number of low-skilled employees is to be found among supervisors.

The supervisory positions in industry appear as a function filled by a great number of employees, at all skill levels. In the same way that the certification level of supervisors is very diversified, one counts a great number of supervisors with little or no qualification, even if a positive correlation does exist between the qualification level of employees and their chances to receive hierarchical responsibilities.

This general observation calls for a closer examination of the heterogeneity of the social and organisational properties of an *ad hoc* population defined by its declaration to assume hierarchical responsibilities. It appears clearly that these employees form a very heterogeneous population, considering their qualifications as well as their skill levels. Declaring to hold hierarchical responsibilities mirrors contrasted realities concerning position, status, and the organisational and relational context of employees.

1.2 What do supervisors do?

The questionnaire of the COI survey provides us with a battery of six questions specifically assessed to the employees who declare some supervisory activity. These questions allow us to describe what these employees are actually doing ("effective functions", See S. Volkoff [1987]) by quickly screening the various possible levels of intervention within the framework of the hierarchical relation. From the most restricted level when interviewees having declared some supervisory activity are asked if they interact with their subordinates "to show them how to do the work" (intervention at the level of the working station) or "to distribute work" (team level) to the wider field of the problems of relationship "to another service" (in the company), even "with a customer" (out of the company). These few questions, even though they lack precision and do not allow to review the whole lot of the tasks attached to supervisory positions, make it possible to assess the variable scope of intervention of the employees that declare holding some hierarchical responsibilities.

It appears firstly that supervisors are fewer to accept these questions as the corresponding scope of intervention widens (See Table 1). Nearly nine supervisors out of ten declare to intervene with their subordinates "to show them how to do the work" (working station), they are only four out of five when it is a

matter of intervening in the event of "problem of relations between colleagues of the same service" (team level) and fewer if such problems appear "with another service" (firm level). The case of supervisors intervening in the event of a "problem with the customer" (out of the company circle) is even rarer – one out of three – but can be explained by a very variable exposure of employees from one industry to the other (according to the sector, the size... of their establishment) to customers' demand.

Table 1: What do supervisors do?

Questions	Fields of intervention		Codes	Rate of positive answers among supervisors
Do you interfere with your subordinates...?	Post	"to show them the know how "	Show how	89,0%
		"if they have a technical problem"	Problem	86,8%
	Team	"to distribute work between them"	Distribute	82,9%
		"if they have a problem of relations between colleagues of the same service"	Disputes	76,6%
	Within Company	"if they have a problem of relationships to another service"	AnotherServ	70,4%
	Out of company	"if they have a problem with a customer"	Clients	33,5%

Source: 1997 'Organisational Change and ICT Use' survey (C.O.I. in French) – DARES, INSEE, CEE.

Field: Employees of industrial companies of 50 employees and over (including food industries).

These six questions, which each define a distinct dimension of what the hierarchical function could mean, tend to overlap for these tasks for which the scope of intervention is most restricted. More than one supervisor out of five give a positive answer to these six questions, and more than one half declare at least "to show" work, "to distribute it", or act in the event of a "technical problem" and of "problem of relations between colleagues of the same service". The tasks relative to the direct supervision of work ("to show" what has to be done and how, to act when a "technical problem" occurs) thus seem to constitute the base of hierarchical responsibilities common to most supervisors. This stands for a minimal version of the supervisory activity, restricted to the scope of working stations and team under the supervisor's responsibility.

It is often as a supplement to these tasks that other responsibilities, less directly related to work stations or teams, and characterized by a broader field of intervention are added. As the scope of intervention widens, the function evolves. From supervising associated with a mission of work supervision, one goes one step up to hierarchical responsibilities of markedly different nature connected with an intermediation function. The employees elected for this function feel they have to play a role of connection between their subordinates and various possible partners (other "services", or "customers"...). The supervisor, through his/her mission of work supervision, can thus also be in charge of making the connection with outsiders (others' subordinates, other divisions in the company, customers...).

1.3 Social characteristics of supervisors according to their responsibilities

To go further in the analysis of the tasks supervisors perform – more precisely to analyse them as a whole and not only separately – we use Multiple Correspondences Analysis (MCA) to shed light on the correlations between the variables describing supervisors' tasks ('active variables').

Structuring the first factorial design, two axis sum up a great piece of the information contained in the multiple correlations existing within those variables. A first axis (horizontal) opposes supervisors assuming most of these tasks to supervisors assuming just a few of them. The second axis (vertical) opposes two 'kinds' of tasks: supervision and intermediation.

Graph 2: Structure of the supervisory tasks
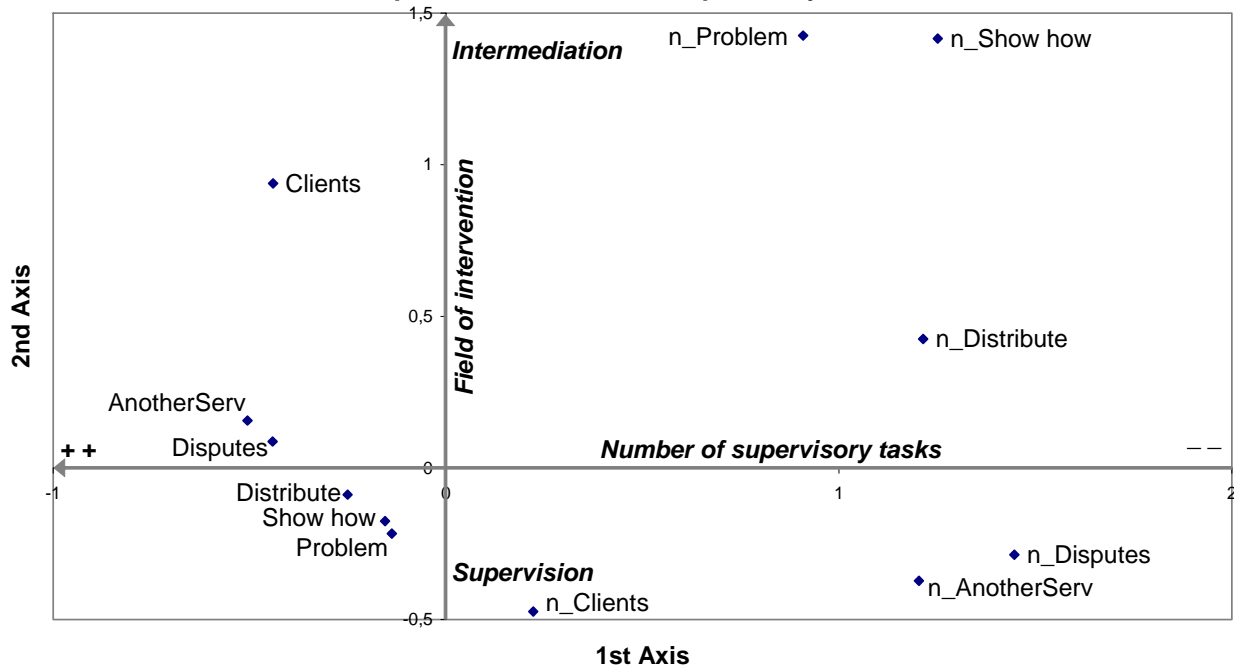
Source: 1997 'Organisational Change and ICT Use' survey (C.O.I. in French) – DARES, INSEE, CEE.
Field: Employees of industrial companies of 50 employees and over (including food industries).
Methodology: Projection of the variables describing supervisory tasks in a Multiple Correspondences Analysis (MCA).

The projection – in additional variables – of the basic socio-demographic characteristics of interviewees (sex, age, educational level and social and economic category) reveals that the supervisory tasks structure (Graph 2) overlaps social structure (Graph 3). The educational and skill levels of supervisors are organized roughly along the diagonal joining the south-eastern quadrant (for the lowest levels) to the north-western quadrant (the highest levels). A contrast related to gender appears along the second diagonal, with a more female north-eastern quadrant and a more male south-western quadrant. Age on the other hand projects in a less clear way in this figure and thus does not seem to play a part in the characterization of the social characteristics associated with the structure of the various forms of supervision we have identified, as structuring as the other variables.

Projected by the analysis in the north-western quadrant of the first factorial design (See Graph 3), the individuals characterized by their tendency to declare they combine all hierarchical responsibilities and in particular those indicating a broader field of intervention (problems with "other services", "customers") correspond to the highest hierarchical type of supervisors (they are often "executives" or engineers) and hold a better qualification (educational level often higher than Bac). Conversely, supervisors of the south-eastern quadrant – with hierarchical responsibilities often only limited to the scope of working stations or teams – frequently happen to hold less skilled jobs (blue or white collar workers) and hold lower level qualifications (CEP, BEPC or CAP-BEP).

Far from being limited to this diagonal, the projection of educational and skill levels reveals a greater complexity in the hierarchy of social characteristics in the factorial design. One can easily make a distinction of two types of hierarchies: between the less skilled/less qualified supervisors of the south-east gradient and the more skilled/more qualified of the north-western quadrant, (See arrows in Graph 3). The first hierarchy, more feminized and administrative, joins these two quadrants by north and forms a level of hierarchical intermediaries for which the responsibilities – often of an administrative or commercial nature – consist in playing a connecting role between various levels of corporate activity (with other teams, with the customers). By ascending order of qualification level, the status of white collar workers, of administrative and commercial intermediate professions, engineers and executives mark out these "careers" of intermediaries. A second hierarchy of statuses, more male, goes more to the south and is identified with a hierarchy of hierarchical supervisors characterized by responsibilities for supervising teams associated with technical roles. They are in this case skilled blue collar workers, technicians, foremen and supervisors.

The vertical axis of the analysis, that can be identified as opposing hierarchical supervision and intermediation, also overlaps with an opposition between responsibilities for technical supervision (to the south) and the responsibilities of an administrative or commercial nature (in north).

Graph 3: Projection of the social properties of supervisors

and structure of attribution of hierarchical responsibilities
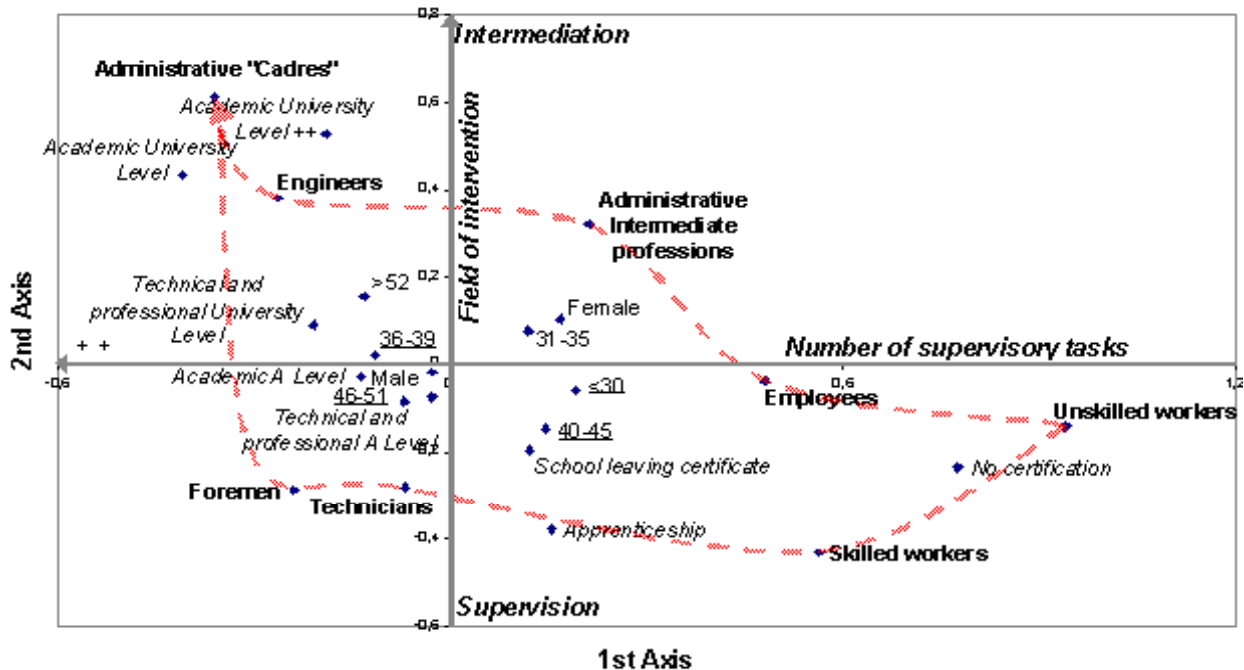
Source: 1997 'Organisational Change and ICT Use' survey (C.O.I. in French) – DARES, INSEE, CEE.
Field: Employees of industrial companies of 50 employees and over (including food industries).
Methodology: Projection of individual additional variables in the first factorial design of the ACM (the numbers refer to the ages).

In order to take advantage of this characterization of supervisors in four sub-groups corresponding to the four quadrants of the factorial design, we carried out a classification in four classes of supervising surveyed according to their co-ordinates into the first axis of the factorial design (volume of the hierarchical responsibilities) and into the second axis (perimeter of the field of intervention). As one could expect, the result of this classification approximately coincides graphically with the four quadrants of the factorial design.

1.4 Four classes of supervisors

In order to identify in the following pages the proposed classes of supervision, we projected in the factorial design the very words used by the interviewees in order to describe their occupation. The COI survey, like most investigations of work, includes an open question about the naming of occupations. Interviewers are specifically told to write the terms of the answer which is given to them, as precisely as possible. This question, along with others, allows in a second step the statisticians of INSEE "to code" the profession, i.e. to place each exact wording under the proper item in the nomenclature of occupations.

Projection in the factorial design of the words spontaneously used by employees to define their occupation makes it possible to give indications on the way in which the various identified shapes of supervising are usually indicated. We thus propose to rename the four classes built by referring to their native designations.

Class 1: Tutors

Supervising south-eastern quadrant of the factorial design (corresponding to class 1 which counts 13 % of supervisors) qualify more often than others their job by referring to their function in the company: they are "operators", "rulers", "mechanics", in charge of "maintenance". We have seen previously that this group has only modest qualification, stands low in the hierarchy of skills (they are massively executants: workmen or employees, See Table 1) whose principal tasks consist of "showing the know how " and acting "in the event of technical problem". Near to the older figure of the "break-down mechanics", these supervising without statute correspond to many regards to the monitors of the car industry in which S. Beaud and M. Pialoux [1999] were interested.

Class 2: Foremen

Supervising south-western quadrant (class 2 – 42,1 % of supervisors) hold responsibilities and status traditionally attached to the agents charged in the factories with the control of workers. It is mainly in this quadrant that project themselves supervisors (often more graduate and qualified that the monitors) which define themselves as "foremen" or "supervisors".

Class 3: Administration

In the North-East of the factorial design (class 3 – 12,4 % of supervising), one finds mainly employees in charge with the administrative supervision of teams. The tasks which are entrusted to them are more often related to the management of problems between subordinates, services or with the customers and much more rarely consist of intervening "to show the know how " or "in the event of technical problem". It is thus significant to observe an over-representation of the administrative and commercial intermediate professions in this class (See Table 2). Among this class a large number of skilled blue collar workers is also to be found. This category of blue collar supervisors workmen assigned to administrative responsibilities is probably associated with the development in industrial companies of new forms of organization of work giving more autonomy to employees and more systematically involving them in a whole range of tasks, in particular administrative, which the companies must face (See principles of neo-fordism described by T. Coutrot [1998], E Appelbaum and R. Batt [1994]).

Class 4: Commercial and administrative direction

Finally supervisors of the north-western quadrant (class 4 – 32,6 % of supervising), highly skilled and educated, cumulating all the hierarchical responsibilities and in particular those relating to the mediation with customers, more spontaneously qualify their profession by its status: they are "executives", "directors" or "engineers"... More generally, these supervisors declare themselves invested of a commercial and administrative duty within the framework of their hierarchical position.

Table 2: Social and economic categories and modes of supervising

(% of supervising)	Class 1 (13,0%)		Class 2 (42,1%)		Class 3 (12,4%)		Class 4 (32,6%)	
	%	o.r.	%	o.r.	%	o.r.	%	o.r.
Administration and commercial executives	2,1%	0,2	8,2%	0,8	11,1%	1,0	**26,7%**	**6,5**
Engineers and technical experts	12,5%	0,7	13,7%	0,9	17,6%	1,1	**37,6%**	**5,5**
administrative and commercial occupations	4,2%	0,9	5,0%	1,5	**9,6%**	**2,4**	5,1%	1,4
Technicians	13,2%	1,5	**15,1%**	**3,3**	7,9%	0,8	7,1%	0,8
Foremen, supervisors	10,8%	0,6	**34,3%**	**5,8**	13,9%	0,8	14,2%	0,9
White collar workers*	**6,1%**	**5,0**	0,9%	0,5	1,5%	0,8	2,2%	1,7
Skilled blue collar workers*	**41,0%**	**4,7**	20,3%	2,2	30,0%	2,7	5,1%	0,3
Unskilled blue collar workers*	**10,2%**	**4,0**	2,6%	0,9	8,4%	3,0	2,0%	0,6
Total	100%		100%		100%		100%	

Source: 1997 'Organisational Change and ICT Use' survey (C.O.I. in French) – DARES, INSEE, CEE.
Field: Employees of industrial companies of 50 employees and over (including food industries).
Reading: Note that the labels identified by '' are the translation of French labels, that don't completely match with the expressions used higher in this article (see page 1).*
Among supervisors, class 1 counts 6,1 % of the white collar workers. Moreover, relative with the other supervisors, their chances to be counted in class 1 rather than in another class are 5 times higher (odds ratio). The highest odds ratios appear in bold, as well as the corresponding proportions.

To the four quadrants of the factorial design correspond thus the four modes of supervision –tutors, foremen, administration and direction – which not only refer each to a specific configuration of hierarchical responsibilities, but can also each one be associated with specific levels of skill and education.

1.5 Indices for a hierarchy of the shapes of supervising

The four modes of supervision we have identified are closely related to the status of jobs. Functions of monitors happen often to be attributed to employees occupying 'rank and file positions' (blue or white collar workers), control with intermediate professions of technical qualification, administration with the administrative and commercial intermediate qualifications and finally direction for the most qualified employees ("cadres" or engineers).

This observation makes it possible to make the following statement: companies value and give different compensation to their supervising staff according to the type of supervising they are supposed to perform. Symbolic as well as economic compensations granted by companies to their staff (See Table 3), vary according to the nature of the entrusted responsibilities.

**Table 3: Net annual remuneration of the employees
according to their responsibilities in the company (in Francs)**

	Average	Median
Not supervising	102 092	95 443
Tutors	129 166	117 259
Foremen	154 523	139 238
Administration	150 850	121 540
Direction	230 156	204 557

Source: 1997 'Organisational Change and ICT Use' survey (C.O.I. in French) – DARES, INSEE, CEE.
Field: Employees of industrial companies of 50 employees and over (including food industries).

In accordance with the structure of attribution of the hierarchical responsibilities in the factorial design which we used to identify the shapes of supervising (See Graph 3), the symbolic and economic compensation rewarding such responsibilities are organized according to two dimensions: one observes indeed on average a better remuneration of the work of intermediation than of supervision (vertical axis of the factorial design) like, for each one of these fields of intervention, the existence of specific gratifications rewarding the office plurality for the tasks (horizontal axis). The combination of these two axes of valorisation of supervising reveals thus that the tasks of direction (characterised by a tendency to combine a plurality of hierarchical responsibilities, in particular with regard to the intermediation work) are better rewarded that the tutors' tasks which provides the lowest symbolic as well as economic compensation.

Once the population of supervisors in industry observed, we should study the probability to access supervisory responsibilities in all the companies, and the way it changed in the last decades.

2. The devaluation of hierarchical positions in France

In 1984, 1991, 1998 and 2005 (dates of the four last waves of the INSEE surveys on Working Conditions), more than one employee out of five declares he/she endorses hierarchical responsibilities (full-time employees in private and public companies). This constantly high rate of supervisors in the French labour force should not induce us to think that nothing has changed nor that the above mentioned statements have had no impact. Indeed, if we observe a constant need among companies concerning supervisory staff, the companies have greatly redesigned the social properties of the employees hired for these positions.

Box 1: The Working Conditions Survey

The Working Conditions survey makes it possible to depict the sociological profile of employees. Conducted and mainly exploited by the Direction of Research and of Statistical Surveys (DARES) of the ministry for employment and solidarity, these surveys are complements to the INSEE Labour force survey. The questionnaire is submitted to all persons in the labour force holding a job and present among the outgoing rotation of the main sample, that is approximately 22 000 individuals in 1998 and 2005 (only 13 000 employed by private companies). The scope of these surveys is the same as the Labour force Survey and is thus representative of the whole of working population holding a job[1]. (However some individuals living in collective quarters may remain absent from the sample)
Data of the Working Conditions Surveys do not rely on objective measures, such as job assessments or work analysis conducted by ergonomists. They rely solely on the declarations of employees. The selected items are as factual as possible.
The investigation is restricted to *employees of private or public companies*. We will not deal in this part with the case of civil servants and self-employed; .

CHEF Question

Labelled 'CHEF' in the questionnaire, a question is replicated at the three waves of the Working Conditions survey (1984, 1991, 1998 and 2005) and is at the heart of this first part: "Do you have other employees under your supervision or your authority?".

2.1 The diffusion of supervisory positions to the lower levels of the qualification scale

As shown earlier, supervising is not a function reserved only to highly qualified employees. In fact, the selection of supervisors becomes more rarely based on formal and certified cultural capital. This result is all the more paradoxical as one could have expected an opposite trend: the educational level of the labour force as a whole has been rising constantly over the last 30 years. One could thus have expected that the subordination relationship should be more and more legitimized using criteria associated with educational qualifications, and that an increasing emphasis should be placed on formal certification when hiring supervisors. This does not happen to be the case.

The degree of certification is an indicator which makes it possible to approximate a symbolic value in terms of status attached to supervising. Mostly delivered before occupational insertion, thus *exogenous*, the degree can be regarded as a form of capital whose volume is fixed *ex ante* and which employees reinvest at the time they enter the company.

The value of educational capital can indeed vary throughout time, and one may argue that it has lost some of its value in the last decades. But the type of degree held remains a relevant indicator of the particular value of an employee on the labour market, and therefore of its bargaining power when being hired. One can then expect that the graduate employees enjoy a broader range of occupational perspectives and tend to prefer the more desirable jobs.

2.1.1 The degree remains a basic criterion for access to hierarchical responsibilities

In 1998, whatever their field of expertise, more qualified employees obviously have higher chances to supervise: among employees holding upper tertiary education degrees, one employee out of two happens to supervise whereas among people holding a lower occupational qualification (CAP-BEP) this is only the case for one individual out of four. Access to supervising positions is lowest among employees with no qualification: only one out of eight holds some supervisory function.

Graph 4: Supervising and qualifications
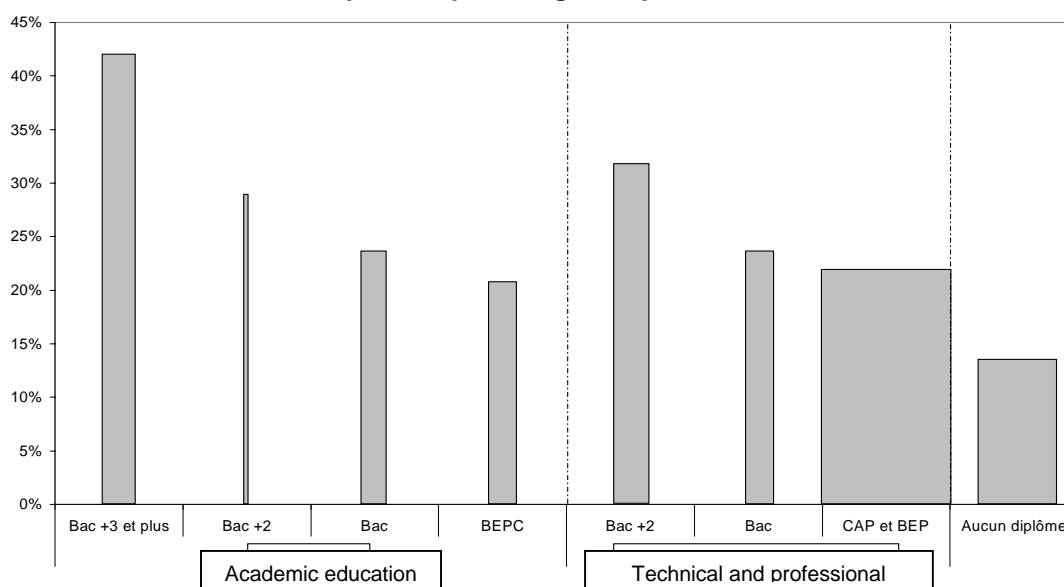
Source: 1998 Working Conditions surveys – INSEE/DARES.
Field: Full-time employees in private and public companies.
Comment: The height of a rectangle is proportional to the rate of supervisors recorded in each category, the width with the size of the category. The surface of a rectangle is thus proportionate with the number of supervisors in the category.

2.1.2 However supervisors with low or no qualification are numerous.

If it appears clearly that if the level of diploma acts positively on the chances to supervise, qualified supervisors nevertheless represent but a small proportion of the total population of all supervisors.

Table 4: Certification in 1998

			All employees	Supervisors
Academic education	Bac +3 and more	(UniversityLevels)	8,4 %	15,8 %
	Bac +2		1,4 %	1,8 %
	Bac	(A Level)	6,4 %	6,8 %
	BEPC	(School leaving certificate)	7,4 %	6,8 %
Technical and professional education	Bac +2	(UniversityLevel)	9,1 %	12,9 %
	BAC	(A Level)	7,2 %	7,6 %
	CAP and BEP	(Apprenticeship)	33,1 %	32,3 %
No certification			27,0 %	16,0 %
Total			100 %	100 %

Source: 1998 Working Conditions surveys – INSEE/DARES.
Field: Full-time employees in private and public companies.
Reading: Holders of a general Baccalaureate represent 6,4 % of all employees and 6,8 % of all supervisors.

The majority of the labour force holds only a relatively low qualification level (BEP-CAP, or no certification). Although employees belonging to this category have but small chances to hold supervisory positions, they represent a majority of all supervisors: Fewer supervisors happen to have a tertiary education degree than supervisors with low or no qualification. Supervisors without certification or holding only a lower vocational certification (CAP-BEP) represent almost one supervisor out of two (see Table 4).

2.2   An investment which becomes less attractive over the years

The study of evolutions between 1984 and 1998 concerning rates of supervisors reveals that the massive presence of less qualified individuals among supervisors is by no mean a declining phenomenon. Quite to the contrary, the link between educational level of diploma and supervising appears much tighter in 1984 than in 1998.

This evolution appears even more striking for graduates with a general rather than with a vocational qualification. For instance, in 1984 the most qualified individuals with a general training were more frequently in charge of supervisory functions than nowadays: they were almost two out of three that declared they were supervisors in 1984 as against fewer than one out of two in 1998 (See Table 5).

Parallel to this evolution, one sees the diffusion of supervisors with no or little qualification throughout the period. CAP-BEP holders and individuals with no qualification are the only ones whose chances to hold a supervisory position remain constant between 1984 and 1998: The rate of individuals declaring supervising has actually even slightly increased in these categories. What results *in absolute numbers* by an important increase of their share among supervisors (See Graph 4 and Table 5).

Table 5: Supervising rates by certification : 1984 - 1998

		1984	1991	1998
General Qualification	Bac +3 and more	63,9 %	57,6 %	42,0 %
	Bac +2	38,4 %	34,5 %	28,9 %
	Bac	32,6 %	24,9 %	23,6 %
	BEPC	26,0 %	26,9 %	20,7 %
Vocational qualification	Bac +2	35,8 %	35,9 %	31,8 %
	Bac	36,0 %	31,5 %	23,5 %
	CAP and BEP	20,9 %	21,3 %	21,8 %
No certification		13,0 %	13,5 %	13,3 %
Total		21,5 %	22,4 %	22,4 %

Source: 1984, 1991 and 1998 Working Conditions surveys – INSEE/DARES.
Field: Full-time employees in private and public companies.
Reading: 32,6 % of a General Bac holders declared to be supervisors in 1984, as against only 23,6 % in 1998.

2.3   The monetary devaluation of supervising

The economic assets associated with supervisory position tend to decrease. The economic compensation for supervisory responsibilities dropped between 1991 and 1998, and the economic gap between

supervisors and regular employees reduced. Employees declaring to assume hierarchical responsibilities loose their comparative advantage in economic terms (See Table 6).

Table 6: Net monthly wages of the supervisors and the non-supervisors (means)

(in Francs)	1991	1998
supervisors	12 132	13 287
Not supervisors	7 139	8 307
Supervisory bonus	+ 69,9%	+ 60,0%

Source: 1991 and 1998 Working Conditions surveys – INSEE/DARES.
Field: Full-time employees in private and public companies.
Reading: In 1991, supervisors earn on average 69,9 % more than the other employees.

The wages of the supervisors are getting closer to regular employees'. But this convergence went along with important structural changes that we mentioned before : Wage earners become increasingly older, whereas younger generations of employees are better educated than in the past. Occupational experience and educational levels are factors which can play a divergent role regarding access to hierarchical responsibilities.

2.4   A devalorisation which varies according to skill

The economic devaluation of supervising is all the more clear as one reaches the top of the scale in skills. The only category that registers a significant drop in the comparative advantage attached to supervising is among "Cadres" (executives). If in 1991 a "Cadre" with supervising functions used to make 21% more than a non supervising one, in 1998, this gap has dropped to 13,5%. During the same period, the economic value of holding supervisory position remains stable in all other categories. This decrease is such that in 1998 the comparative advantage of holding a supervisory position becomes less among cadres than among unskilled white or blue-collar workers.

Table 7: Wage Bonus for supervisors

	1991		1998	
	Coefficient	Standard deviation	Coefficient	Standard deviation
Together	29,7 %	1,4 %	27,1 %	1,2 %
« Cadres »	21,0 %	3,6 %	13,5 %	2,7 %
Intermediate professions	10,1 %	1,7 %	11,8 %	1,5 %
skilled blue or white collar workers	10,0 %	1,3 %	8,8 %	1,2 %
Unskilled blue or white collar workers	18,0 %	3,5 %	18,1 %	3,4 %

Source: 1991 and 1998 Working Conditions surveys – INSEE/DARES.
Field: Full-time employees in private and public companies.
Methodology: Regression of ordinary least squares.
Reading: In 1991, at age, sex, diploma, nationality, social origin being kept equal, supervisors' wages were higher by 29,7% than the wages of other employees. Within the "Cadres" population (executives), this bonus rises to 21 %.

The price of supervising is maintained at the bottom and falls at top. It is then clear at this point that, under the name of supervisors (setting as equivalent individuals who gave the same answer to the same question), we designate a population which has experienced major transformations concerning their social characteristics as well as the work they are supposed to perform.

3. Toward a trend in the growth of the blurring in the ESeC prototype ?

All these evolutions lead to describe a general trend towards less prestige attached to the role of work supervising in firms (I): less qualified, lower placed in the wage hierarchies, benefiting from lower compensation levels, the employees that declare supervising other workers (that is having "one or more employees under their orders or their authority") have lost today a part of the prestige (symbolic hierarchies and wage scales) which they still enjoyed at the beginning of the Eighties. This increased devaluation of hierarchical functions has benefited certain categories traditionally dominated with work and so far largely excluded from these types of responsibilities. At the same time as prestige associated with these positions degrades itself, young people, women and less qualified employees gradually gain access to hierarchical responsibilities. This trend in the devaluation of supervisory functions may undermine the capability of any socio-economic classification largely carried out on such information. More generally, it is necessary to observe how any prototype manages to capture these evolutions and if its accuracy is declining or not.

In numerical terms, the socio-economic structure revealed by ESeC prototype, as proposed in Eric Harrison and David Rose (2006), is shifting since the early 80's from the bottom of the classification to the top: proportionally less skilled workers and self-employed occupations ('Petit bourgeoisie or independents (2)') and more salariat occupations (ESeC 1 and 2).

Table 8: Frequencies in the ESeC classes (1984 – 2005)

		1984	1991	1991	1998	2005
		Employees only		All		
ESeC1	Higher salariat	7%	9%	8%	9%	11%
ESeC2	Lower salariat	19%	19%	17%	19%	22%
ESeC3	Higher grade white collar workers	17%	16%	15%	14%	14%
ESeC4	Petit bourgeoisie or independents (1)			6%	5%	5%
ESeC5	Petit bourgeoisie or independents (2)			4%	3%	2%
ESeC6	Higher grade blue collar workers	8%	9%	8%	8%	7%
ESeC7	Lower grade white collar workers	12%	13%	12%	13%	12%
ESeC8	Skilled workers	14%	13%	12%	10%	9%
ESeC9	Semi- and non-skilled workers	24%	21%	19%	18%	19%
Total		100%	100%	100%	100%	100%

Source: 1984, 1991, 1998 and 2005 Working Conditions surveys – INSEE/DARES.

If quite stable in numerical terms, ESeC inertial properties[18] appear under-efficient. The Inter-classes inertia[19] is dramatically lowering between 1998 and 2005. It is for the classes ESeC 7,8 and 9 – which corresponds to the lower classified workers – that the loss of accuracy is visible: intra-classes inertias are increasing. A trend in the growth of the blurring in the ESeC prototype is clearly identified (See Table 9).

Table 9: Decomposition of the inertia (all "employment relationship" variables)

		1984	1991	1991	1998	2005
		Employees only		All		
ESeC1	Higher salariat	7%	7%	7%	8%	10%
ESeC2	Lower salariat	18%	20%	18%	17%	18%
ESeC3	Higher grade white collar workers	13%	14%	11%	11%	11%
ESeC4	Petit bourgeoisie or independents (1)			3%	2%	3%
ESeC5	Petit bourgeoisie or independents (2)			2%	1%	1%
ESeC6	Higher grade blue collar workers	8%	9%	7%	7%	3%
ESeC7	Lower grade white collar workers	12%	13%	11%	12%	12%
ESeC8	Skilled workers	12%	12%	10%	9%	12%
ESeC9	Semi- and non-skilled workers	24%	20%	17%	17%	22%
Inter-classes inertia		6%	5%	14%	16%	8%
Total		100%	100%	100%	100%	100%

Source: 1984, 1991, 1998 and 2005 Working Conditions surveys – INSEE/DARES.

---

[18] Inertias are computed calculating the global L2-variance within the three sets of employment relationship variables :

$$Inertia = \sum_{i=1}^{p} \left(\frac{1}{N} \sum_{j=1}^{N} x_{i,j}^{2} - \bar{x}_i^{2} \right)$$, in the case of p variables and N individuals ($x_{i,j}$ corresponding to the answer of

the individual j to the question i).

[19] An accurate classication should maximise inter-classes intertia and minimise intra-classes intertias.

Various "employment relationship" situations may be characterised in the French Working conditions surveys, in order to better identify the underlying evolutions. Three sets of variables are carried out in order to capture three dimensions of Goldthorpe's model (See Cécile Brousse, Part One, 2.3, page 7):

➢ Autonomy versus subordination;
➢ « Assets specificity » (skill, competencies);
➢ Type of labour contract.

Different scenarios emerge from a separate analysis of these three dimensions. Namely, it appears that, in labour contracts terms, it is at the top of the classification that the blurring is the strongest: the labour contract conditions of large employers, professionals and higher grade technician and supervisory occupations are more heterogeneous as time goes by – specially since the early 00' (See Table 10).

Table 10: Decomposition of the inertia ('Type of labour contract' only)

		1984	1991	1991	1998	2005
		Employees only		All		
ESeC1	Higher salariat	8%	6%	6%	7%	10%
ESeC2	Lower salariat	20%	19%	16%	18%	23%
ESeC3	Higher grade white collar workers	15%	17%	14%	14%	14%
ESeC4	Petit bourgeoisie or independents (1)			2%	2%	2%
ESeC5	Petit bourgeoisie or independents (2)			1%	0%	1%
ESeC6	Higher grade blue collar workers	8%	6%	5%	6%	6%
ESeC7	Lower grade white collar workers	15%	15%	12%	12%	12%
ESeC8	Skilled workers	11%	12%	10%	9%	8%
ESeC9	Semi- and non-skilled workers	22%	22%	18%	19%	17%
Inter-classes inertia		2%	4%	17%	13%	7%
Total		100%	100%	100%	100%	100%

Source: 1984, 1991, 1998 and 2005 Working Conditions surveys – INSEE/DARES.

As 'Autonomy versus subordination' variables are concerned, the evolutions concern the bottom of the classification. New forms of organizational structures in firms aim at the responsabilisation of all workers, and in particular of the lower grade workers. Thus, lower grade workers are not the subordinates they used to be. More and more personally in charge of their production segments and of the results of the production process, their working conditions, mainly in terms of autonomy and subordination, are complexifying.

Table 11: Decomposition of the inertia ('Autonomy vs. subordination' only)

		1984	1991	1991	1998	2005
		Employees only		All		
ESeC1	Higher salariat	6%	7%	6%	8%	9%
ESeC2	Lower salariat	19%	17%	15%	16%	18%
ESeC3	Higher grade white collar workers	15%	14%	12%	12%	13%
ESeC4	Petit bourgeoisie or independents (1)			2%	1%	2%
ESeC5	Petit bourgeoisie or independents (2)			1%	1%	1%
ESeC6	Higher grade blue collar workers	9%	8%	7%	8%	5%
ESeC7	Lower grade white collar workers	12%	13%	11%	12%	12%
ESeC8	Skilled workers	13%	13%	12%	11%	13%
ESeC9	Semi- and non-skilled workers	25%	23%	20%	20%	23%
Inter-classes inertia		1%	5%	13%	11%	6%
Total		100%	100%	100%	100%	100%

Source: 1984, 1991, 1998 and 2005 Working Conditions surveys – INSEE/DARES.

A further ESeC prototype should better integrate this renewal of employment relationship conditions in firms. We then recommend that the empirical evolutions – shown here in the French case only – relative to the current ESeC prototype should be better analyzed, in order to shed light on the pertinent dimensions that should be taken into account in the definition of an European Socio-Economic Classification.

The current efforts to develop a socio-economic classification offer a great opportunity to work on identifying the criteria that are necessary to build a classification that should succeed to remain stable in time.

References

APPELBAUM E., BATT R. (1994), *The new American Workplace*, Ithaca, New York, ILR Press.

BEAUD S., PIALOUX M. (1999), *Retour sur la Condition Ouvrière*, Fayard.

BOLTANSKI L. (1982), *Les cadres*, Editions de Minuit.

BOLTANSKI L., CHIAPELLO E. (1999), *Le nouvel esprit du capitalisme*, Gallimard.

BOUFFARTIGUES P. (2001a), *Cadres : la grande rupture*, La Découverte.

BOUFFARTIGUES P. (2001b), *Les cadres : fin d'une figure sociale*, La Dispute.

BOURDIEU P. (1994), *Raisons Pratiques. Sur la Théorie de l'Action*, Points Seuil.

COUTROT T. (1998), *L'entreprise néo-libérale, nouvelle utopie capitaliste ?*, Paris, Textes à l'appui (La Découverte).

DESROSIÈRES A., THÉVENOT L. (2000), *Les catégories socioprofessionnelles*, Repères (La Découverte).

GOLDTHORPE J. (2000), *On Sociology, Numbers, Narratives and the Integration of Research and Theory*, Oxford University Press.

GOLLAC M., VOLKOFF S. (2000), *Les conditions de travail*, Repères (La Découverte).

HARRISON E., ROSE D. (2006), *The European Socio-economic Classification (ESeC) – Draft User Guide*, Essex University.

TROUVE P. (1996), « La fin des contremaîtres traditionnels ? », Revue Française de Sociologie, n° 38, pp. 287-308.

VOLKOFF S. (1987), « L'encadrement : de la catégorie statistique à la fonction exercée », Economie et Statistiques, n° 204 (pp. 30-41).

WOLFF L. (2005), *Transformations de l'intermédiation hiérarchique*, Centre d'Etudes de l'Emploi, Rapport de Recherche n°29, novembre 2005.

WOLFF L. (2006), « Monitorat, maîtrise, administration et direction : Quatre formes du travail d'encadrement dans l'industrie », Réseaux, n° 214.

PART THREE

OCCUPATIONAL MOBILITY MEASURED WITH PROTOTYPE ESEC AND NATIONAL CLASSIFICATION: TWO DIFFERENT PERSPECTIVES

Olivier MONSO

INSEE
Employment Unit
timbre F230
18 boulevard Adolphe Pinard
75 675 PARIS
FRANCE

Olivier.Monso@insee.fr

Monitoring occupational experience is a way of studying the stability of a classification at an individual level. It makes it possible to verify that movements between social groups are not too frequent, and are justified in terms of the definition of the classification. We first pose the question of whether occupational mobility as described using the Prototype ESeC[20] can identify usual results regarding socio-occupational mobility in France. Then we ask whether using the ESeC results in a change of perspective in the analysis of occupational mobility – first from a quantitative point of view, in its creating more or less mobility; and then from a qualitative point of view, in its placing the accent on specific criteria of mobility between social groups. Regarding these two points, ESeC is compared with two nine-point classifications stemming from the French classification of Occupations and Socio-Occupational Categories (*Professions et Catégories Socioprofessionnelles* – PCS). The result is that generally speaking, the Prototype ESeC does make it possible to recover and confirm the results obtained with classifications derived from the PCS. However, it creates more mobility, in part due to its coverage of mobility in management functions (achieving or losing the status of supervisor), a parameter which is not taken into consideration in the other two classifications being considered. Additional work would be necessary to determine whether the instances of mobility in the ESeC are accompanied by actual concrete changes in employment relations, and whether they enable pertinent studies of socio-occupational mobility during the course of a career. The question of the volume of mobility that is "acceptable" for a classification must also be posed, given the interest, in many studies, of ensuring a certain stability in the social positions over time.

1. Data: the 2003 Training and Vocational Qualification Survey (FQP 2003[21])

The FQP 2003 survey collected information on employment and qualifications (formal education, post-formal training). The information collected on the occupation also concerns several specific points in the trajectory of a given individual (entry into working life, situation at the time of the survey[22] and five years before the survey, monitoring of all the changes in employment taking place in the five years preceding the survey). We use that information here by comparing the social group occupied in 1998 with the group occupied in 2003, for those persons who declared they were employed at both those dates and for several definitions of the social groups. The occupation is coded using the PCS classification, gathering many items of information on the title of the occupation, the occupational status (family worker, self-employed, salaried business manager, other salaried employee), the qualification, the function occupied, and also the sector of activity and the size of the company. This information is used to code the occupation in the ISCO sub-group (three digits)[23]. To code the ESeC category, in addition to the ISCO sub-groups, we also use questions on employment status ("Do you exercise your occupation… on your own account? as a salaried employee?"), on the number of employees employed by business owners ("Do you have employees? How many?"), and finally the question "Do you have one or several employees under your authority?," which contributes to defining the status of "supervisor" as understood by the ESeC. All these criteria are used to determine what ESeC category the person belongs to, and can also be used in working out alternative classifications.

2. A panorama of occupational mobility in France between 1998 and 2003 with the prototype ESeC

15.3 million persons employed in 2003, between ages 30 and 54 as of that date, were already employed in 1998. Out of these, we focused on the 14.9 million individuals to whom we can attribute an ESeC category at both dates[24]. A quarter of the men (26%) changed ESeC categories between the two dates, compared to a fifth of the women (19%). For men and for women, the largest flux (in number) is toward the "lower salariat" and corresponds in large measure to promotions, in particular from the "higher grade white collars" and

---

[20] We will at times use the term "ESeC" alone, but we are always referring to the Prototype ESeC, as presented by the User Guide dated February 2006 (Harrison and Rose, 2006).

[21] Enquête Formation et qualification professionnelle

[22] The individual's occupational position is also compared to that of his or her ascendants, so that the survey is frequently used to study social mobility in France (see, for example, Erikson, Goldthorpe and Portocarero, 1979).

[23] ISCO is itself coded based on the Occupations and Socio-Occupational Categories (PCS) by applying a conversion table or "crosswalk."

[24] If we limit ourselves to individuals declaring that they were employed in 2003 and in 1998, ages 30 to 54 in 2003, the missing values are most often the result of the impossibility of ISCO coding in 3 headings (six cases out of ten). For the rest of the cases, the values are missing from the occupational-status variable, as defined in the User Guide (Harrison and Rose, *op.cit.*).

Box 1. The French Classification of PCS

In this paper, we use jointly the ESeC prototype and classifications which are derived from the French Classification of Professions et Catégories Socioprofessionnelles. (PCS). The PCS Classification was launched in 1982, then replacing the old classification of CSP (Catégories Socioprofessionnelles). Since then, it was (a little) modified only once in 2003.

The purpose of the PCS Classification is to give a nomenclature of occupations at a fine level (497 categories) that can easily be aggregated at intermediary levels (42 or 24 categories) and at the most aggregated level (8 categories). At this level, the classification is composed of six categories of working people[26] :

1. Farmers;
2. Craftsmen, tradesmen and general managers;
3. Senior civil service, senior managerial staff and higher intellectual professions;
4. Middle-level professions;
5. Clerical and service staff;
6. Manual workers.

Whereas the ESeC prototype is based on a theoretical representation of employment relations, the PCS Classification has been built upon French institutional working statuses, as they are defined by law or collective agreements : this characteristic is for example embedded in the existence of different colleges of workers for professional elections[27]. Besides, the building of the PCS has integrated the willing to define homogeneous categories, from the point of view of social practices, educational attainment and other aspects linked to social position. The six categories of working people can thus be interpreted as social groups. They differentiate from each other by their occupational status (the categories 1. and 2. are non-salaried people, the other categories are mostly salaried), the type of occupation (which allows to differentiate clerical staff and manual workers) and their place in hierarchy (3 and 4 are from the side of managers while 5 and 6 are rather from the side of subordinate workers).

The PCS have proved to be efficient to analyse various aspects of French economy and society : income distribution, educational attainment, cultural practices, political choices or life expectancy, among others themes.

From the point of view of mobility studies (intergenerational mobility or career paths), the PCS have at least two advantages. First, the structure of PCS (from 6 to 497 categories) allow it to be aggregated or disaggregated quite easily. In the paper, we have extended social groups in order to have the same number of classes as the prototype ESeC (which makes job mobility rates a bit more comparable). Second, the groups of salariates in the PCS can be hierarchised, according to income, place in the organisation of work, or educational attainment. This allow to define ascendant, horizontal or descendant mobility, as well in career paths as in intergenerational comparisons.

"lower grade white collars" categories[25]. There are also a lot of trajectories from "higher salariat" to "lower salariat," both in terms of flux and of proportion of the group of origin: For men as for women, 13% of persons in "higher salariat" were in "lower salariat" five years later. Men also stand out due to mobility, in the world of unskilled labour, between "semi and unskilled workers" and "skilled workers" toward "higher grade blue collars," and also from "higher grade blue collars" and "skilled workers" toward
 "lower salariat." Here we note the marked presence of a "technical promotion path," already pointed out in other work done on socio-occupational mobility in France (Chapoulie, 2000; Monso, 2006). As for women, 8% of them who were in the "semi and unskilled workers" category moved to the "lower grade white collars" category, which, in addition to mobility toward "lower salariat," tends to show the pre-eminence of an "administrative" promotion path, in the world of white-collar workers. These trajectories seem to be made in "stages" – people rarely move directly from "semi and unskilled workers" to "lower salariat." The "intermediate" categories of "white collars" and "blue collars" (of "higher" and "lower" level) consequently play an important role in mobility, either as starting categories or as arrival categories.

The least mobile categories among men are found among independents (categories 4 and 5), and also in Classes 1 and 2, which can be considered as the upper end of the socio-economic hierarchy (Harrison and Rose, *op. cit.)* In all these starting categories, the rate of mobility varies from 4% for farmers ("independents 5") to 22% for men in the "lower salariat." Female mobility has in common with male mobility a strong stability among farmers (6% mobile) and among members of "higher salariat" and "lower salariat" classes.

---

[25] For the Prototype ESeC, we use here, in our comments and tables, the « common terms » of the User Guide instead of the full titles of classes, with the exceptions of the ESeC4 and ESeC5 categories (which are designated by the same common term), for which we use "independants 4" (Small employer and self employed occupations, excepted from agriculture, etc.) and "independants 5" (Self employed occupations in the agricultural sector)".

[26] The two other categories are 7. Retired persons and 8. Other persons without occupational activities.

[27] After the Second World War, the three main colleges in professional elections, for the private sector, were *cadres* (managerial staff), ETAM (*Employés, Techniciens, Agents de Maîtrise* - clerical staff, technicians, foremen) and *ouvriers* (workers). These institutional definitions contributed to assert the existence of the corresponding statistical categories, that we all find today in the PCS at the most aggregated levels (*cadres, employés, ouvriers* for the social groups in eight classes, *techniciens, agents de maîtrise* for the social categories in 24 classes).

Two strong divergences between men and women appear. The first is the mobility of "white collars": Whereas these categories are mobile and offer frequent promotions for men, they seem to offer women fewer possibilities for evolution. A male "higher grade white collar" has twice as many chances of being promoted to the "lower salariat" or "higher salariat" than a woman in the same category. The second difference is the lower mobility of women in the "lower salariat"; 4% of them attain "higher salariat" status as against 9% for men. So, while the Prototype ESeC may not be optimally suited to analysis in terms of upward or downward mobility (due to the difficulty of hierarchising the classes[28]), the analysis of mobility between ESeC classes, and in particular access to Classes 1 and 2, is revelatory of mobility trajectories that are differentiated according to sex, and which again are reflected in recent work done on socio-occupational mobility in France (Monso, *op. cit.).*

Table 1. Changes in prototype ESeC class between 1998 and 2003 for persons employed at both dates

Prototype ESeC class in 1998		Higher salariat	Lower salariat	Higher grade white collar	Indepdts 4	Indepdts 5	Higher grade blue collar	Lower grade white collar	Skilled workers	Semi and unskilled workers	Total
		Prototye ESeC class in 2003									
Higher salariat	Men	83	13	1	1	0	2	0	0	1	100
	Women	83	13	3	0	0	0	1	0	0	100
Lower salariat	Men	9	78	3	1	0	4	1	2	2	100
	Women	4	87	6	1	0	1	1	0	0	100
Higher grade white collar	Men	6	20	64	2	0	2	4	0	3	100
	Women	2	10	79	0	0	1	4	1	3	100
Independants 4	Men	2	3	1	82	0	3	1	2	5	100
	Women	0	4	3	80	1	1	5	2	5	100
Independants 5	Men	0	1	0	2	96	0	0	1	0	100
	Women	0	0	0	0	94	0	0	3	0	100
Higher grade blue collar	Men	3	9	3	5	1	66	2	6	7	100
	Women	2	10	9	2	0	60	10	1	6	100
Lower grade white collar	Men	1	7	7	3	0	7	65	2	7	100
	Women	0	3	8	1	0	3	77	1	6	100
Skilled workers	Men	1	5	1	3	0	12	1	68	8	100
	Women	0	3	4	3	1	5	6	69	9	100
Semi and unskilled workers	Men	1	3	2	2	0	8	3	6	75	100
	Women	0	1	4	1	0	3	8	2	81	100
Total	Men	13	23	7	6	4	12	5	13	18	100
	Women	7	26	23	3	1	3	18	2	17	100

Field: persons age 30 to 54 as of 31 December 2003, employed in 1998 and in 2003.

Reading: among men employed in 1998 and in 2003, age 30 to 54 in 2003, and who were in the "higher salariat" in 1998, 83% remained in the higher salariat in 2003. 13% moved to the "lower salariat".

Note: grey cells represent the ten principal mobility fluxes for men and for women (a total of twenty cases).

---

[28] Harrison and Rose (*op. cit.*) point out that "the classes are not consistently ordered according to some inherent hierarchical principle. However, so far as overall economic status is concerned, Classes 1 and 2 are advantaged over Classes 3, 6, 7, 8 and 9."

3. A comparison with other classifications derived from national classification (PCS)

In order to provide points of comparison, we start with alternative classifications formed on the basis of the French PCS classification. The PCS Classification has been built upon French work institutions, as defined by law and collective agreements, and has also taken into account the willing to build homogeneous categories according to social position (see Box 1). This social position integrates the position in employment relationships, but mainly through institutional statuses, whereas ESeC intends to start from more factual relations. Besides, social position in the PCS is also obviously linked to other aspects like social practices or educational attainment. At its most aggregate level, this classification can be used to isolate six "social groups": farmers, craftsmen/tradesmen/general managers, senior civil service / senior managerial staff / higher intellectual professions, middle-level occupations, clerical and service staff, manual workers. At a finer level (coded in two digits), it can also be used to make a distinction between skilled and unskilled workers, which we have done here. For white-collar workers, we use the distinction between skilled and unskilled proposed by Olivier Chardon (see for example Alonzo and Chardon, 2006). Starting with that principle, we propose two alternatives:

- a distinction between "administrative and commercial" middle-level occupations (public or private sector) on the one hand and "industrial" middle-level occupations, technicians and foremen on the other. We have named this classification GS9A.

- a distinction, within managers and higher intellectual professions, between managers in the public service, on the one hand, and managers in enterprise and the liberal professions on the other. We have named this classification GS9B.

In each of these cases, we arrive at a classification in nine classes, that is, the same number of classes as in the Prototype ESeC. At that point an initial comparison of the proportions of mobile individuals resulting from each of the classifications can be made.

Table 2: Proportion of changes of social group according to several classifications

	Prototype ESeC	Variants on the PCS (nine positions)		Socio-occupational groups (PCS six positions)
		GS9A	GS9B	
Percentage of mobile men	25.7	22.3	21.7	18.0
Percentage of mobile women	19.2	17.4	17.4	14.3

Field: persons age 30 to 54 as of 31 December 2003, employed in 1998 and in 2003.
Reading: among men age 30 to 54 in 2003, employed in 1998 and in 2003, 25.7% changed ESeC class between those two dates.
Source: Training and Vocational Qualification (Formation et qualification professionnelle) survey 2003.

The proportion of mobile individuals obtained by comparing six-position socio-occupational groups (derived from the one-digit PCS classification) in 1998 and in 2003 is 18% for men and 14% for women. Proportions of mobile persons are much lower than in the ESeC (26% and 19% respectively), but it is to be expected that the higher number of classes in ESeC will induce, mechanically, more mobility. When, starting with the PCS, we move to nine-position classifications, GS9A and GS9B produce quasi-identical mobility rates – 22% for men and 17% for women. This is still lower than the mobility rates in ESeC. For France, and given the occupational classifications commonly used up to now, it seems that the Prototype ESeC induces a larger number of mobile individuals. From that point on, we use GS9A (which distinguishes between administrative and commercial middle-level occupations[29] and technical middle-level occupations) more specifically, since it offers a slightly more balanced distribution among the social groups than GS9B (the managerial group being much more limited in size than that of middle-level occupations). This classification is different from ESeC in particular since, being inspired by the French PCS classification, it tends to be

---

[29] This term is to be understood in terms of the French classification of Occupations and Socio-Occupational Categories (*Nomenclature des Professions et Catégories Socioprofessionnelles* – PCS).

based more on legal qualifications and statuses (public-service grades, collective-bargaining agreements, etc.), whereas ESeC is based on a representation of employment relations (relationship to the hierarchy, etc.). Below (Table 3) we give the rates of mobility in social group GS9A, analogously to Table 1 for ESeC.

Studying mobility using this classification produced several results that were obtained using ESeC, in particular low mobility among agricultural workers and the higher classes (managers and higher intellectual professions). Among men, unskilled workers appear as highly mobile – a result found in more marked fashion than in ESeC: The mobility rate reached 40% for unskilled white-collar workers and 36% for unskilled blue-collar workers. Among women, the most mobile categories are again found among the blue-collar workers (skilled or unskilled). The spread between mobility among men and mobility among women was maintained, and is visible in particular with administrative and commercial middle-level occupations (respectively 30% and 16%) and skilled white-collar workers (respectively 40% and 17%), which recalls the results obtained with ESeC for the "lower salariat" and "lower grade white collars."

For men and women together, 23% of individuals changed ESeC groups between the two dates. Among them, more than a third did not change social groups, as that term is understood in GS9A. The converse is a little more rare: Among persons who changed social groups in GS9A, a fourth did not change ESeC groups. This supports the idea that mobility as calculated in the Prototype ESeC and in the classifications derived from the PCS coincides only in part. In particular, ESeC engenders a large share of mobility that is not visible using the classifications derived from the PCS.

Table 3. Proportion of individuals who changed social groups (GS9A classification)

In%

Group in 1998	Proportion of mobile individuals	
	Men	Women
Managers, higher intellectual professions	10	10
Administrative and commercial middle-level occupations	30	16
skilled white-collar	27	18
Craftsmen, tradesmen and general managers	17	24
Farmers	4	4
Industrial middle-level occupations	27	32
Unskilled white-collar	40	17
Skilled blue-collar	19	25
Unskilled blue-collar	36	26
Total	22	17

Field: persons age 30 to 54 as of 31 December 2003, employed in 1998 and in 2003.
Reading: among men age 30 to 54 in 2003, belonging to the category of managers and higher intellectual professions
in 1998, 10% changed social groups (according to the GS9A classification) between 1998 and 2003.

Source: Training and Vocational Qualification (Formation et qualification professionnelle) survey 2003.

If we focus more precisely on the principal trajectories in ESeC which don't appear in GS9A, we observe that half of them are in the direction of the "lower salariat" and "higher grade blue collars" groups. The most frequent paths are indicated in the table 4. We can offer two main interpretations. The first has to do with the role of the "supervisor" variable: without changing occupations, a person can change social groups in ESeC terms because the individual has been assigned supervisory duties over subordinates that he or she did not have beforehand. That is the case, for example, with a *gendarme* who becomes a warrant officer (he or she can change from "higher grade white collar" to "lower salariat" in ESeC terms, yet remain a "skilled white-collar worker" in GS9A terms); or with a mason who had taken on supervision of a crew on a construction site (and thereby moved from "skilled blue collar" to "higher grade blue collar" while still remaining a "skilled blue-collar worker" in terms of GS9A) when interviewed in 2003, but had no one under his authority in 1998. A second interpretation has to do with the very specific character, in ESeC, of the "higher salariat" and "lower salariat" categories, which introduce fine distinctions, from the point of view of employment relations, within the "managers and higher intellectual professions" group. As an example, a teacher with an *agrégé* degree and a research-and-development engineer will be classified in the same category in the GS9A classification on the basis of the required level of skill. Yet in ESeC terms, the engineer

will be considered as having more specific "organisational skills" than the teacher. Thus a move between the two functions will be interpreted as a transition between "higher salariat" and "lower salariat"[30].

Table 4. Principal mobilities in prototype ESeC that are not found in the GS9A classification

Starting class	Arrival class	Number of persons concerned (thousands)	Proportion among the mobile persons in ESeC
Higher grade white collars	Lower salariat	137	47%
Skilled workers	Higher grade blue collars	124	77%
Higher salariat	Lower salariat	110	62%
Semi and unskilled workers	Higher grade blue collars	85	53%
Lower salariat	Higher grade white collars	81	53%

Field: persons age 30 to 54 in 2003, employed in 1998 and in 2003, and who changed ESeC groups between those two dates.
Reading: Among persons age 30 to 54 in 2003 employed in 1998 and in 2003 and who moved from "higher grade white collars" to "lower salariat," 137 thousand remained stable in the GS9A classification, which represents 47% of the total number of transitions between "higher grade white collars" and "lower salariat."

Source: Training and Vocational Qualification (Formation et qualification professionnelle) survey 2003.

The converse case – transitions in the GS9A classification that are not accompanied by a transition in ESeC – corresponds to a large degree (Table 5) to trajectories to middle-level administrative occupations, managers and higher intellectual professions, and skilled workers (together accounting for half of all cases). This appears to correspond to a (relative) lack of correspondence of the Prototype ESeC to French institutional specificities, in particular in the public service and in industry, where specific collective-bargaining agreements apply. In the first instance, we can give the example of a lower secondary-school teacher who earns the status of certified *agrégé* secondary teacher, yet who still remains in the "lower salariat" in ESeC. In the second instance, we can cite the transition from unskilled blue-collar construction worker to skilled mason. This transition is meaningful from the point of view of a classification based on the PCS, which is itself influenced by the status of the applicable collective-bargaining agreement in France. For ESeC, on the other hand, this case corresponds to stability within the "skilled workers" category.

Table 5. Principal mobilities in the GS9A classification that are not found in prototype ESeC

Starting group	Arrival group	Number of persons concerned (thousands)	Proportion among the mobile persons in GS9A
Middle-level admin. occ.	Mgrs. and higher int. prof.	119	42%
Skilled white-collar	Middle-level admin. occ.	88	33%
Unskilled blue-collar	Skilled blue-collar	80	48%
Mgrs. and higher int. prof.	Middle-level admin. occ.	51	46%
Middle-level admin. occ.	Skilled white-collar	40	33%

Field: persons age 30 to 54 in 2003, employed in 1998 and in 2003, and who changed GS9A groups between those two dates.
Reading: Among persons age 30 to 54 in 2003, employed in 1998 and in 2003, and who moved from "middle-level administrative occupations" to "managers and higher intellectual professions" in the GS9A classification, 119 thousand remained in the same ESeC category, which represents 42% of the total transitions between "middle-level administrative occupations" and "managers and higher intellectual professions."

Source: Training and Vocational Qualification (Formation et qualification professionnelle) survey 2003.

---

[30] To determine what an individual's "organisational skills" are, we might ask, for example, what the cost of his or her departure would be, strictly from the point of view of transmission of occupational skills and knowledge of the organisation. In the preceding example, what is at issue for ESeC, then, is not whether the teacher is more or less skilled than the engineer, but rather the more or less specific nature of his or her skills and what costs his or her departure (from the educational institution or the engineering bureau, etc.) would engender in terms of replacement and reorganisation.

4. Changes and immobility in prototype ESeC: How are they related to changes of occupation?

The specificities of the Prototype ESeC prompt us, in the interest of internal coherence, to analyse the mechanisms of mobility in the classification in greater depth, and in particular the relation between change of category in ESeC and change of occupation. The move from one ESeC category to another can be due, logically, to two factors: a change in ISCO occupation (coded in three digits) or a change of occupational status (Harrison and Rose, *op. cit.*). The classification is based above all on the three-digit ISCO classification. This is illustrated by the fact that "typical" occupations in ISCO can be attributed to each ESeC class, and also by the fact that the classification is allowed to be reconstructed in a simplified way based solely on the ISCO three-digit variable (in the case where the available surveys do not provide the other variables). In the great majority of changes of ESeC group (84% of all cases), there has been a change of ISCO sub-group (Table 6). This means that, in 16% of all cases, there is a change of social group in ESeC that is associated with stability in the ISCO occupation. This percentage is highly variable depending on the ESeC starting group: 97% of mobile individuals between 1998 and 2003 who started in the "higher salariat" changed occupation according to ISCO. The same is true of only 70% of mobile individuals who started in the "skilled blue-collar workers" category. The percentage also varies greatly with the arrival ESeC group. As an example, only 57% of transitions to "higher grade blue collars" are accompanied by a change of occupation. The result is that certain types of transition between social groups are not closely associated with a change of occupation, particularly when the transitions start in (or arrive at) the "higher grade blue collars" category. The percentage of transitions between "lower grade white collars" and "higher grade blue collars" which correspond to a change of occupation in ISCO is only 32%. Thus the changes involved are mostly related to managerial functions (sometimes associated with a change in the size of the company). These situations are found both in industry and the tertiary sector (see the previously cited examples of the mason who becomes a crew foreman, or the *gendarme* who becomes a warrant officer).

So, while the great majority of cases of occupational mobility in ESeC are associated with a change of "occupation" (in the three-digit ISCO), the percentage of cases of mobility not related to a change in ISCO occupation is not negligible, and above all is highly variable depending on the type of mobility being considered. This poses two problems: First, there is the problem of the significance of a change in social group which does not involve a change of occupation (even at a fine level), or which is the result of the modification of a single criterion of construction of the classification. How, for example, should we consider the 260,000 individuals who changed ESeC category (8% of the total number of cases of mobility in ESeC) but for whom, among the criteria for construction of the classification, only the supervisory function has changed?[31]

5. Conclusion

Coming to the end of this brief analysis of occupational mobility with the Prototype ESeC, it appears that this classification can reconstitute, in a very general way, the results obtained with classifications derived from France's PCS (for example the higher mobility of men, in particular among unskilled workers). But the analysis of mobility also points up specificities of ESeC: It creates more mobility than do the classifications derived from the PCS. A significant percentage of this additional mobility is related to variations in supervisory tasks (becoming a supervisor can result in a change of social group in ESeC) and more generally to variations in "organisational skills" between two occupations. It is not surprising that the Prototype ESeC does not fully coincide with institutional criteria specific to France (French collective-bargaining agreements for example), given its vocation of being adapted simultaneously to a large number of countries. Nevertheless, we must ask whether these classification criteria with "universal" scope, intended for determining the social structure as well as the mobility of individuals in each country, can be implemented with pertinence and provide results interpretable in a (fairly) similar way. In particular, its internal coherence would have to be studied more in depth by posing the question of whether changes in ESeC category indeed correspond to concrete changes in the area of employment relations (Is the person still subject to control by the hierarchy to the same degree? Does the person have more flexibility in setting production deadlines? etc.) and in other areas associated with the socio-occupational position (Does he or she have a higher

---

[31] Another, more technical problem is related to the possibility of applying a simplified conversion table based only on the ISCO classification (Harrison and Rose, *op. cit.*, pp. 14 and 15). Interpretation of the results, in this case, will have to take into account the bias introduced, which leads to underestimation of certain types of mobility which are more disconnected from the ISCO occupation, and more particularly cases of mobility related to a change in supervisory status.

income? Has he or she acquired new qualifications as a result of training? etc.)[32]. By means of work of this type, we would endeavour to determine whether the interpretation we make of the cases of mobility in this prototype classification is coherent with the reading of society it proposes. Finally, based on the initial results of this study (and on deeper examination), the question of the scope of mobility and its impact on analyses of economic and social phenomena requiring a certain stability of the classification needs to be asked. When studying, for example, the state of health, fertility, or transitions on the labour market based on the Prototype ESeC, we must keep in mind that a not-insignificant proportion of persons will no longer be in the same category five years later.

Table 6. Proportion of changes of occupation (three-digit ISCO) for individuals who have changed ESeC group, by starting group

In%

Prototype ESeC class in 1998	Proportion of mobile persons in ISCO	
	Men	Women
Higher salariat	97	98
Lower salariat	93	83
Higher grade white collar	76	83
Independents 4	84	75
Independents 5	84	ns
Higher grade blue collar	76	72
Lower grade white collar	84	90
Skilled workers	70	84
Semi and unskilled workers	87	91
total	83	86

Field: persons age 30 to 54 as of 31 December 2003, employed in 1998 and in 2003 and having changed ESeC groups between those two dates.

Reading: among men age 30 to 54 in 2003, having changed ESeC groups between1998 and 2003, 97% have a different (3-digit ISCO) occupation.

Note: the numbers of women in the category "independents 5" in 1998 are not significant.

Source: Training and Vocational Qualification (Formation et qualification professionnelle) survey 2003.

References

ALONZO, P., CHARDON O. (2006), *"Quelle carrière professionnelle pour les salariés non qualifiés ?"* (" Professional careers for unskilled workers"), *Donneés sociales 2006*, Insee.

CHAPOULIE S. (2000), *"Une nouvelle carte de la mobilité professionnelle"* ("A New Professional Mobility Map"), *Économie et Statistique* No. 331, Insee.

ERIKSON R., GOLDTHORPE J. H. AND PORTOCARERO, L. (1979), "Intergenerational class mobility in three Western European societies: England, France and Sweden," *British Journal of Sociology*, Vol. 30, No. 4.

HARRISON E. AND ROSE, D. (2006), "The European Socio-Economic Classification [ESeC], Draft User Guide," University of Essex, Colchester, UK.

MONSO O. (2006), « *Changer de groupe social en cours de carrière. Davantage de mobilité depuis les années quatre-vingt* » (« Moving from a social group to another. Mobility increased since the eighties »), *INSEE Première*, n°1112.

---

[32] These questions, as well as the preceding ones, can be studied with the help of the FQP 2003 survey.

GENERAL APPENDIX

APPENDIX A: The class schema developed by R. Erikson and J. Goldthorpe

A summary by David Rose

"This note is my summary of various statements by John Goldthorpe and Robert Erikson concerning the employment relations approach to class. I have not given chapter and verse in terms of sources, but the key text is Goldthorpe's Chapter 10 of On Sociology (OUP: 2000). The actual form of the ESeC schema is very close to the EGP schema itself, of course.

Following the class schema developed by Erikson and Goldthorpe, the ESeC equivalent needs to capture two main distinctions. First, it must distinguish between those who own the means of production and those who do not. Within the former, it needs to differentiate large from small employers; and employers from the self-employed or own account workers. Within the latter, the ESeC classes need to discriminate employee positions in terms of the type of employment relationship that prevails – the service relationship (SR), the labour contract (LC) or mixed forms that have elements of both SR & LC. The service relationship entails a long-term and diffuse exchange of rewards for commitment. The labour contract is a very specific exchange of wages for efforts in a closely supervised context, as discussed in more detail below.

When we turn to employees, it is the form of employment regulation that determines class position. That is, class does not depend on the work performed but on the rewards obtained from work, both currently and prospectively. How employers regulate employees so that they act in the best interests of the organization depends on the type of work involved. That is, employment contracts are tailored to different types of work. Three types of employment regulation are identified: the labour contract, mixed forms and the service relationship.

Goldthorpe has distinguished two dimensions along which work is differentiated:

1. The degree of human 'asset specificity' involved and
2. The extent of difficulty in monitoring work

The labour contract

Where there are no serious problems either in monitoring the quality and/or quantity of work, employees can be rewarded in direct relation to their productivity. Where asset specificity is low in the sense that jobs require only general, un-specific skills, employees are easily replaced.

Where these both coincide, we would expect to find employment would be regulated by a labour contract. The labour contract entails a relatively short-term exchange of money for effort. Employees are closely supervised and give discrete amounts of labour in return for a wage. Payment is calculated on or related to the amount of work done or required or by the actual amount of time worked. Hence, employees paid by the piece are the classic example, e.g. machinists in batch manufacturing. Employees who are hourly paid also tend to have labour contracts. They have limited autonomy with regard to the pace of work because this is often controlled by technology, as on assembly lines, for example.

So, nothing in the LC is designed to provide a long-term employment relationship or any investment by employers in employees' human capital. These conditions are found in non-skilled manual occupations and define Class 9 of ESeC.

However, in a modified form the labour contract also applies to skilled occupations in Class 8. Modification of the labour contract arises because the monitoring of such work is less clear-cut. Hence, payment systems might be modified (e.g. a weekly wage rather than hourly paid, or nowadays even a 'salary' in the limited sense of a direct payment to a bank account).

Lower grade non-manual occupations in Class 7 also appear to have a modified labour contract. However, from UK evidence, it would appear that the employment contracts of occupations in this class are superior to those of Classes 8 and 9. This may, in part, be due to the fact that lower non-manual workers are mainly employed by large bureaucratic organisations in both the public and private sectors. This may give some 'incremental' element to labour contracts through better human relations policies. Even so, asset specificity problems are not a real issue, nor are those of monitoring. Part-time, flexible working is, however, a feature of Class 7, a class in which married women and students with part-time jobs predominate. One might have expected, as Erikson and Goldthorpe clearly did, that in all the circumstances this class would be very similar to Class 9, with a purer form of labour contract predominating. Yet, at any rate so far as UK data on employment relations are concerned, this does not seem to be the case.

The service relationship

Where there are problems or hazards for the employer in terms both of monitoring and asset specificity, a service relationship is used to provide incentives to the employee to act in the employer's interests. The SR is the means by which employers seek to create and sustain a moral commitment to the organisation by employees. The prospective elements in the SR are crucial here, with career prospects being of particular importance. The SR effectively defines

Class 1 and exists in a modified form for Class 2, that is the SR applies to managerial, administrative, higher supervisory, occupational and higher technician positions.

Professionals (and higher technicians) are employed to exercise specialized knowledge or expertise which has been gained from lengthy training. Managers, administrators and higher supervisors are employed to exercise the employer's delegated authority.

Each of these situations implies an asymmetry of information between the employer and the employee. There has to be an area of autonomy and discretion for the employee into which monitoring by the employer cannot easily reach.

Equally, there are asset specificity problems. In particular, employers need to ensure that employees' initial skills are developed to the benefit of the organisation. For these reasons, long-term contracts are offered which aim to encourage the employee to invest in learning, especially of an organisationally specific kind.

The most effective ways of dealing with these problems of monitoring and asset specificity are through the prospective elements of the service relationship, such as annual salaries on incremental scales, career ladders and perquisites such as pension schemes.

Mixed forms

Some occupations, however, have a 'mixed;' form of employment regulation. In the case of routine non-manual work, there are no real asset specificity problems but there are monitoring problems. This leads to a departure from the pure LC towards that of the SR. Hence routine non-manual employees typically are on salary scales and have some autonomy over time. However, there is less in the way of a career structure when compared to Classes 1 and 2, i.e. no move in the direction of a long-term employment relationship. Class 3 is typical here.

The opposite situation arises in the case of lower supervisory and lower technician occupations. Here there are asset specificity problems but not monitoring ones. This leads to such occupations having greater security and some element of 'job ladders' if not career structures, when compared with 'skilled' and 'non-skilled' occupations in Classes 8 and 9. That is, here there is some move towards a longer-term employment relationship. Class 6 is typical here.

Indicators related to Employment relations

As the above implies, the most important indicators of the type of employment regulation are form of payment, perquisites, control over working time/pace of work, security and promotion opportunities".

APPENDIX B: Crosswalk from national classification (PCS-2003) to ISCO-COM(88)

The mapping from PCS-2003 to ISCO(COM)-88 is based on what can be measured in French statistical sources. It reflects our interpretation of concepts such as "manager», which do not make immediate sense in the French context (Bisourp, 2005). The term "professionals" for which we lack equivalent in French may correspond to "the professions libérales", the engineers, and higher intellectual occupations. Hence, the PCS and ISCO classifications differ in some respects.

Concerned with a better quality of the mapping from PCS to ISCO(COM)-88, it was necessary to introduce the local unit economic activity variable the modalities of which are those of the French Activity Classification (NAF Ed: 1993) in three figures and one letter (700 headings).

The French classification has 486 basic codes. The following codes have no exact equivalence in ISCO(COM)-88 and may correspond to several of them: it was decided to aggregate them and to create a corresponding fictitious heading in ISCO(COM)-88 according to the rule that was set in that matter

ISCO 200	*Professionals*
PCS 342e	Public-sector researchers
ISCO 410	*Office clerks*
PCS 523a	*Commis* and clerical assistants, civil service
PCS 524a	*Agent de bureau*, civil service
ISCO 700	*Craft and related trade workers*
PCS 486e	General maintenance, installation and new construction supervisors (excluding mechanical, electromechanical and electronics)
PCS 628f	Skilled laboratory workers (excluding chemicals, health)
PCS 628g	Other skilled industrial workers
PCS 637b	Skilled workers : artistic crafts
PCS 637d	Other skilled crafts workers
PCS 685a	Other unskilled crafts workers
ISCO 710	*Extraction and building trades workers*
PCS 621e	Other skilled workers in public works
PCS 621f	Skilled workers in public works (employees of State and local governments)
ISCO 720	*Metal, machinery and related trades workers*
ISCO 800	*Plant and machine operators and assemblers*
PCS 676e	Other unskilled industrial workers
ISCO 820	*Machine operators and assemblers*
PCS 674e	Unskilled production workers: wood and paper manufacturing industries
ISCO 910	*Sales and services elementary occupations*
PCS 564b	Other service employees

The code PCS 431e midwives: They are considered as an intermediate health and social work occupation and not as executives, this is why it corresponds to the code ISCOCOM 323 Nursing personnel and midwives (intermediate level) and not to the code ISCOCOM 223 Nursing executives and midwives.

The codes ISCO 200, 700 and 800 regroup the whole three-figure ISCO codes beginning with the same first figure. The codes ISCO 410, 710, 720, 730, 740, 820 and 910 regroup the whole three-figure ISCO codes beginning with the same first 2 figures.

APPENDIX C: Prototype ESEC and the national classification (PCS): a comparison

Cécile Brousse

ESeC classification presents common points with the French classification of PCS but also important differences. In what follows, the European classification in 9 headings is compared to the level 1 of the French classification (in 6 groups) but if the case arises, the relations between ESeC and level 2 of the French classification (in 31 categories) are shown.

Common points

1) As the classification of PCS, the European classification is not a simple list of occupations classified by level of skills (such as ISCO for instance), but it grants importance to the status; thus the split self-employed/wage-earners is an important element in the structure of the European classification : the heads of small enterprises and the self employed are regrouped in classes which are proper to them (classes 4 and 5).

2) As the French classification, ESeC classifies the groups of wage-earners partly according to their position in the enterprise (i.e. the distance which separates them from management functions).

3) In ESeC, most of the heads of farms are isolated in a specific category (class 5), distinct from the other heads of enterprise. In PCS all the farmers come under the same social group (group 1).

4) Even if in the current project, these aspects are not perfectly dealt with, the European classification is designed to cover the whole population including the persons who no longer work or who have never worked. The PCS proceeds in a similar way through allocating a socio-occupational group to the persons not in the labour force or unemployed (resting on the former occupation or on the one of the reference person of the household).

5) In the European project, as in the French classification the <u>wage-earning</u> associate spouses are dealt with in the same way as other wage-earners.

Differences

1) In the French classification, the sequencing of the groups of wage-earners rests partly on the categories worked out in the framework of collective agreements (executives, technician, supervising staff, skilled, unskilled workers) or on the ranks for the wage-earners in the civil service. The European classification refers to the notion of "manager" (managing executive) or of "supervisor" (supervising staff). Practically, the hierarchical position of a wage-earner is measured on the one hand by means of his (or her) position in the international classification of occupations since this classification identifies the "managers" and on the other hand thanks to the response this wage-earner gives to a survey questionnaire by which he (or she) is asked whether he (or she) has subordinates under his (or her) responsibility)

2) The PCS classification appears as a three level classification (the 486 headings of occupations are regrouped in 31 socio-occupational categories which are distributed in 6 social groups) In its current version, ESeC is a very aggregated classification. However all the designers of ESeC state that the future users will be able to work out themselves detailed regroupings of occupations according to their study subject and thus to have a two dimension classification.

3) The classes 1 and 2 of ESeC regroup as well the members of The Occupations, the great entrepreneurs such as the wage-earners of executive level whereas PCS establishes a very sharp distinction between the heads of great enterprises on one side and higher executives on the other. In the French classification, the heads of great enterprises are regrouped with the heads of small ones, the artisans and the shopkeepers (group 2), as for the higher executives and the members of The Occupations they are clearly associated to wage-earners in the French meaning of the term (they are gathered in group 3).

4) The <u>non-salaried</u> associate spouses are not described in classification ESeC. They belong to class 10, so-called "excluded". In the classification of PCS if a person helps a member of his (or her) family

who is an artisan, the coding is performed as for the latter. If he (or she) performs secretariat , sale or accounting work, the coding is performed in a specific PCS (coming under category 21). Similarly if the person helped performs one of The Occupations, the coding in PCS classifies him (or her) in catgeory 31. Lastly, if the person helped is a member of another self-employed occupation, the coding is performed as for the person helped.

5) In classification ESeC, the workers and employees who perform the most routine tasks are regrouped in an only and same category (class 9). On its side the PCS at its most aggregated level does not isolate the skilled workers from unskilled workers (but the distinction appears at level 2 of the classification). But currently the PCS does not allow to distinguish the employees according to their level of skills in as much collective agreements do not rest on such feature. Exploratory work have been conducted notably in the Employment division to improve the knowledge of social hierarchies in the group of the employees which could lead to classify the employees according to their level of skills into two distinct groups.

6) In the French classification farmers are classified in the group of farmers even if the enterprise employs more than 10 wage-earners. In the project of European classification, the heads of agricultural enterprises which employ more than 10 wage-earners are classified with the heads of enterprise of industry, trade or services.

7) In the classification of PCS the threshold of 10 wage-earners is not applied in a uniform manner. Thus because of their financial importance, the activities of fleet owner, banker are classified in the category of the heads of 10 wage-earners or more (at level 2) even if they employ less than 10 wage-earners. On the other hand in the project of European classification the importance of an enterprise is measured solely from its number of wage-earners, including in agriculture.

8) The classification ESeC sets between groups 1 and 2 a distinction between the persons of higher rank and those of lower rank according to the skills measured in ISCO and the hierarchical position in the enterprise. In the French classification the group 3 is not hierarchical. It opposes The Occupations, the executives of civil service, the enterprise executives, the engineers, the teachers, the occupations of information, arts and entertainment.

9) At level 2, the classification of the PCS is organized around categories of wage-earners of public sector, of categories of wage-earners of private sector, and of mixed categories. The French classification distinguishes also the workers of industrial type and the workers of artisanat. In the classification ESeC, these distinctions disappear to the benefit of other splits : the degree of skills required in the occupation, the routine character of tasks.

Table 1 : Cross National classification One-digit and Prototype ESeC

National classification One-digit	Prototype ESeC								
	ESeC5	ESeC4	ESeC1	ESeC2	ESeC3	ESeC6	ESeC7	ESeC8	ESeC9
G1- Farmers and smallholders	100								
G2- Artisans, shopkeepers and company managers	1	95		2		1			
G3- Administrators and managers, higher grade professionals			55	45					
G4- Intermediate-grade professionals			3	58	28	7		2	2
G5- Non-manual employees			3	2	27	4	39		27
G6- Workers						10	4	38	49
Total	2	5	10	21	15	5	12	10	20

Field: People working, aged 15 or more, living in an ordinary household.
Sources: Working Conditions Survey, DARES, 2005 (provisional data) and Labour Force Survey 2005 , INSEE

Table 2 : Cross National classification Prototype ESeC and One-digit

Prototype ESEC	National classification One-digit					
	G1	G2	G3	G4	G5	G6
	Farmers and smallholders	Artisans, shopkeepers and company managers	Administrators and managers, higher grade professionals	Intermediate-grade professionals	Non-manual employees	Workers
ESeC 5	97	3				
ESeC 4		97		3		
ESeC 1			84	7	10	
ESeC 2		1	31	66	2	
ESeC 3				46	54	
ESeC 6		1		35	20	44
ESeC 7				1	92	7
ESeC 8				5		94
ESeC 9				2	40	58
Total	2	5	15	24	30	24

Field: People working, aged 15 or more, living in an ordinary household.
Sources: Working Conditions Survey, DARES, 2005 (provisional data) and Labour Force Survey 2005 , INSEE

Cross National classification (PCS two-digits) and prototype ESeC one-digit

Table 3 allows notably to assess the weight of classes ESeC on the scope of employed active as of the whole persons at work or having worked. The two classes regrouping the less persons are classes of self-employed (heads of small or medium enterprises) with a few % each. Conversely, the more numerous two classes (15 to 20% each) are the 2 ("lower salariat") and the 9 (routine occupations). The other classes regroup each roughly 10% of the population.
A manner to study the correspondence between social groups (1st figure of French CS) and the class ESeC is to see how each CS are distributed between the different classes ESeC (table 4). Account been taken of the number of social groups (6) and of the number of classes ESeC (9 on the scope retained for exploitation), most of the groups are distributed over several classes ESeC (often different according to the two figure CS considered). The farmers and trading artisans are an exception : the former (CS='1') are to be found for 98% in the fifth class ESeC, and the latter (CS='2') in majority in the fourth class ESeC. The four other social groups are to be found essentially in the seven other classes ESeC, which therefore allows to give of them a more precise vision, but with a segmentation which does not correspond any longer necessarily to the one of two figure French CS.
Thus, the employees (CS='5') are distributed between the class ESeC 7 (« employees of lower level ») and - according to the two figure CS - class 3 ("employees of higher level") or class 9 ("routine occupation". The workers (CS='6') are distributed as to them generally between class 8 ("skilled workers") and the 9 ("routine occupation"). However the break down of workers between the two classes ESeC is far from covering the French distinction between skilled and unskilled workers: in ESeC, the artisan workers are rather to be found in higher classes, the workers of industrial type in class 9. Thus half of unskilled workers of artisan type are not classified in 9, whereas 36% of skilled workers of industrial type are to be found there. One can also mention the case of the drivers, similar to skilled workers in France, but classified in "routine occupations" in ESeC [33].
As the previous categories the executives (CS='3') are distributed over two classes ESeC, the first one (for The Occupations, the engineers and executives) and the second (for teachers, administrative and commercial executives). Exercising (or not) hierarchical responsibilities seems to play a quite important role to explain the break down of executives in one of the two classes, the dimension "expertise" being maybe less valued.
At last, the break down of intermediate occupations between the classes ESeC 2 and 3 leads to classify less well the administrative and commercial professionals (in comparison with more technical occupations) as it also seemed to be the case besides for the executives.

---

[33] This case is the subject of discussions within the consortium, without any consensus being possibly found.

Table 3 : Cross National classification and Prototype ESeC One-digit

Groupe	Catégories socio-profesionnelles	ESeC5	ESeC4	ESeC1	ESeC2	ESeC3	ESeC6	ESeC7	ESeC8	ESeC9
G1	Farmers	98		1					1	
G2	Craftsmen	3	91	1			4		1	
	Shopkeepers		86	1	3		10			
	Company managers		45	44	41					
G3	Liberal professions			95	5					
	Senior civil servants			16	84					
	Teachers and scientific professions			27	73					
	Information professionals, creative and performing artists			14	81	5				
	Corporate executives (administration and sales)			46	54					
	Engineers and and senior technical satff of businesses			94	6					
G4	Primary school teachers and related workers			8	51	41				
	Middle-level health and social welfare workers				77	23				
	Middle-level civil servants			18	82					
	Middle-level administrative commercial and managerial staff of businesses		2		30	62	5			1
	Technicians			1	99					
	Production supervisors and general foremen						85	2	9	4
G5	Clerical level civil servants and related				3	29	5	33		31
	Police and armed forces			58			1	14		18
	Businesses clerical workers				7	68	2	23		
	Sales staff		1				11	88		
	Domestic and other personal service workers		1				3	52		44
G6	Skilled industrial workers						18		43	36
	Craft work skilled employees						25		66	9
	Drivers		1				5			94
	Skilled freight handlers warehousemen and transport equipment operators						14	46	8	31
	Unskilled industrial workers						7			92
	Craft work unskilled employees		1				5		46	49
	Agricultural workers						6		90	4
	TOTAL	3	5	9	19	14	8	13	10	18

Legend:
- from 0 to 49 %
- from 50 to 74%
- from 75 to 100%

Field: People working, aged 15 or more, living in an ordinary household.
Sources: Working Conditions Survey, DARES, 2005 (provisional data) and Labour Force Survey 2005 , INSEE

Of course, these first comments and results must be deepened, through maybe comparing the results stemming from Labour Force Survey 2005 and FQP 2003. It would also be interesting to compare variables of employment relations measured according to ESeC and according to PCS.

At last, it appears essential to return to 4 figure PCS codes to better understand the differences of classification and to see in which extent these differences of classification may be connected to approximates in the use of the method (use of a regrouped ISCO code, use of value by default of the derivation matrix…). Another way to analyze the correlation betweeen PCS and ESeC consists in trying to establish directly a correlation table (with no previous coding in ISCO) (see Appendix C)

APPENDIX D: Crosswalk from national classification (PCS-2003) to prototype ESeC

Study of a direct correspondence between national classification (CS/PCS) and the prototype ESeC

Christel Colin and Louis-André Vallet

INSEE has attempted to implement ESeC prototype without ISCO code but basing itself solely on the literary description of the 9 classes and using the four or two-digits national classification (Biscourp, 2005). In their recent work, Christel Colin and Louis-André Vallet have explored in parallel, the coding of ESeC from the international classification of occupations and the coding of ESeC from the national classification (2 or 4 digits) CS/CPS. Their work consisted in exploring systematically two different and as well legitimate manners to construct prototype ESeC for France.

Firstly, from their general understanding of the classification ESeC and from previous comments (November 2005) by David Rose and Eric Harrison on the correspondence between the French socio-professional categories and the classification ESeC, they have allocated each occupation (four digit) Socio-occupationnal category (PCS) to a class of ESeC. So doing, they have consequently built the classification ESeC form the national socio-professional classification.

Second, they systematically examined and sometimes revised the correspondence previously established between PCS and 3-digit ISCO, then we constructed ESeC on the basis of ISCO as proposed by the Consortium. Their comparison between these two paths suggests that several problems still have to be seriously considered as regards the ISCO-based construction of ESeC.

For instance, according to the matrix, ISCO groups 122 (Production and operations managers) and 247 (Public service administrative professionals) are by default classified in ESeC class 2. However, according to our PCS-ISCO correspondence table, these groups respectively correspond to professions in CS 37 (Cadres administratifs et commerciaux d'entreprise) and professions in CS 33 (Cadres de la fonction publique) and, according to the underlying logic of the ESeC classification, CS 33 and CS 37 should belong to class 1.
Another difficulty is that ISCO category 700 (Craft etc. trades workers) generally corresponds in the matrix to ESeC class 8 and ISCO category 800 (Plant and machine operators and assemblers) generally corresponds in the matrix to ESeC class 9. As a consequence, the ISCO-based construction of ESeC might classify a skilled worker in a very large factory in ESeC class 9 (instead of 8) and an unskilled worker in a very small establishment in ESeC 8 (instead of 9). We do not encounter such difficulties with the PCS-based construction of ESeC: CS 62 (Ouvriers qualifiés de type industriel) and CS 63 (Ouvriers qualifiés de type artisanal) are correctly allocated to ESeC class 8 (Lower technical occupations (Skilled workers)); similarly, CS 67 (Ouvriers non qualifiés de type industriel) and CS 68 (Ouvriers non qualifiés de type artisanal) are correctly allocated to ESeC class 9 (Routine occupations (Semi- and non-skilled workers)).
Many French surveys carried out by the French statistical office do not include the question needed to identify the supervisory status. As a consequence, it is extremely difficult to identify ESeC class 6 in these surveys on the basis of the ISCO-based construction and matrix. There is no similar difficulty on the basis of the PCS-based construction of ESeC: the whole CS 48 (Contremaîtres, agents de maîtrise) is included in ESeC class 6, as well as part of CS 47 (Techniciens).

1 – Large employers, higher grade professional, administrative and managerial occupations (Higher salariat)

    23 – Chefs d'entreprise de 10 salariés ou plus
    31 – Professions libérales
    33 – Cadres de la fonction publique
    35 – Professions de l'information, des arts et des spectacles
    37 – Cadres administratifs et commerciaux d'entreprise
    38 – Ingénieurs et cadres techniques d'entreprise

2 – Lower grade professional, administrative and managerial occupations and higher grade technician and supervisory occupations (Lower salariat)

    34 – Professeurs, professions scientifiques
    42 – Professeurs des écoles, instituteurs et assimilés
    43 – Professions intermédiaires de la santé et du travail social
    44 – Clergé, religieux
    45 – Professions intermédiaires administratives de la fonction publique
    46 – Professions intermédiaires administratives et commerciales des entreprises

3 – Intermediate occupations (Higher grade white collar workers)

    52 – Employés civils et agents de service de la fonction publique
    53 – Policiers et militaires
    54 – Employés administratifs d'entreprise

4 – Small employer and self employed occupations (except for agriculture etc) (Petit bourgeoisie or independents)

    21 – Artisans
    22 – Commerçants et assimilés

5 – Self employed occupations (agriculture etc) (Petit bourgeoisie or independents)

    11 – Agriculteurs sur petite exploitation (moins de 20 hectares équivalent-blé)
    12 – Agriculteurs sur moyenne exploitation (de 20 à 40 hectares équivalent-blé et activités assimilées)
    13 – Agriculteurs sur grande exploitation (40 hectares équivalent-blé et plus)

6 – Lower supervisory and lower technician occupations (Higher grade blue collar workers)

    47 – Techniciens
    48 – Contremaîtres, agents de maîtrise

7 – Lower services, sales and clerical occupations (Lower grade white collar workers)

    55 – Employés de commerce
    56 – Personnels des services directs aux particuliers

8 – Lower technical occupations (Skilled workers)

    62 – Ouvriers qualifiés de type industriel
    63 – Ouvriers qualifiés de type artisanal

9 – Routine occupations (Semi- and non-skilled workers)

    64 – Chauffeurs

65 – Ouvriers qualifiés de la manutention, du magasinage et du transport
67 – Ouvriers non qualifiés de type industriel
68 – Ouvriers non qualifiés de type artisanal
69 – Ouvriers agricoles

1 – Large employers, higher grade professional, administrative and managerial occupations (Higher salariat)

            CS 23 en totalité   Chefs d'entreprise de 10 salariés ou plus

    CS 31 en grande partie   Professions libérales
      à l'exception de :   *311d – Psychologues, psychanalystes, psychothérapeutes (non médecins)*
            313a – Aides familiaux non salariés de professions libérales effectuant un travail administratif
    CS 33 en totalité   Cadres de la fonction publique
    CS 34 en partie   Professeurs, professions scientifiques
      à l'exception de :   *341a – Professeurs agrégés et certifiés de l'enseignement secondaire*
            343a – Psychologues spécialistes de l'orientation scolaire et professionnelle
    CS 35 en partie   Professions de l'information, des arts et des spectacles
      à l'exception de :   *354a – Artistes plasticiens*
            354b – Artistes de la musique et du chant
            354c – Artistes dramatiques
            354d – Artistes de la danse, du cirque et des spectacles divers
            354g – Professeurs d'art (hors établissements scolaires)
    CS 37 en totalité   Cadres administratifs et commerciaux d'entreprise
    CS 38 en totalité   Ingénieurs et cadres techniques d'entreprise
    CS 45 en faible partie   Professions intermédiaires administratives de la fonction publique
      sont inclus :   ***451d – Ingénieurs du contrôle de la navigation aérienne***

2 – Lower grade professional, administrative and managerial occupations and higher grade technician and supervisory occupations (Lower salariat)
    CS 31 en faible partie   Professions libérales
      sont inclus :   *311d – Psychologues, psychanalystes, psychothérapeutes (non médecins)*
    CS 34 en partie   Professeurs, professions scientifiques
      sont inclus :   *341a – Professeurs agrégés et certifiés de l'enseignement secondaire*
            343a – Psychologues spécialistes de l'orientation scolaire et professionnelle
    CS 35 en partie   Professions de l'information, des arts et des spectacles
      sont inclus :   *354a – Artistes plasticiens*
            354b – Artistes de la musique et du chant
            354c – Artistes dramatiques
            354d – Artistes de la danse, du cirque et des spectacles divers
            354g – Professeurs d'art (hors établissements scolaires)
    CS 42 en grande partie   Professeurs des écoles, instituteurs et assimilés
      à l'exception de :   *422e – Surveillants et aides-éducateurs des établissements d'enseignement*
    CS 43 en grande partie   Professions intermédiaires de la santé et du travail social
      à l'exception de :   ***435b – Animateurs socio-culturels et de loisirs***
    CS 44 en totalité   Clergé, religieux

CS 45 en grande partie   Professions intermédiaires administratives de la fonction publique
à l'exception de :   ***451d – Ingénieurs du contrôle de la navigation aérienne***

CS 46 en partie   Professions intermédiaires administratives et commerciales des entreprises
sont inclus :

461a – Personnel de secrétariat de niveau supérieur, secrétaires de direction (non cadres)
461d – Maîtrise et techniciens des services financiers et comptables
461e – Maîtrise et techniciens administratifs des services juridiques ou du personnel
461f – Maîtrise et techniciens administratifs des autres services administratifs
462a – Chefs de petites surfaces de vente (salariés ou mandataires)
462c – Acheteurs non classés cadres, aides-acheteurs
462d – Animateurs commerciaux des magasins de vente, marchandiseurs (non cadres)
462e – Autres professions intermédiaires commerciales (sauf techniciens des forces de vente)
464a – Assistants de la publicité, des relations publiques (indépendants ou salariés)
464b – Interprètes, traducteurs (indépendants ou salariés)
465a – Concepteurs et assistants techniques des arts graphiques, de la mode et de la décoration (indépendants et salariés)
466a – Responsables commerciaux et administratifs des transports de voyageurs et du tourisme (non cadres)
466b – Responsables commerciaux et administratifs des transports de marchandises (non cadres)
466c – Responsables d'exploitation des transports de voyageurs et de marchandises (non cadres)
467a – Chargés de clientèle bancaire
467b – Techniciens des opérations bancaires
467c – Professions intermédiaires techniques et commerciales des assurances
467d – Professions intermédiaires techniques des organismes de sécurité sociale

CS 47 en partie   Techniciens
sont inclus :

471a – Techniciens d'étude et de conseil en agriculture, eaux et forêt
472a – Dessinateurs en bâtiment, travaux publics
472b – Géomètres, topographes
472c – Métreurs et techniciens divers du bâtiment et des travaux publics
473a – Dessinateurs en électricité, électromécanique et électronique
473b – Techniciens de recherche-développement et des méthodes de fabrication en électricité, électromécanique et électronique
474a – Dessinateurs en construction mécanique et travail des métaux
474b – Techniciens de recherche-développement et des méthodes de fabrication en construction mécanique et travail des métaux
475a – Techniciens de recherche-développement et des méthodes de production des industries de transformation
478a – Techniciens d'étude et de développement en informatique
479a – Techniciens des laboratoires de recherche publique ou de l'enseignement
479b – Experts salariés ou indépendants de niveau technicien, techniciens divers

3 – Intermediate occupations (Higher grade white collar workers)

CS 31 en faible partie   Professions libérales
> *sont inclus :*
>> *313a – Aides familiaux non salariés de professions libérales effectuant un travail administratif*

CS 42 en faible partie   Professeurs des écoles, instituteurs et assimilés
> *sont inclus :*
>> *422e – Surveillants et aides-éducateurs des établissements d'enseignement*

CS 43 en faible partie   Professions intermédiaires de la santé et du travail social
> *sont inclus :*
>> ***435b – Animateurs socio-culturels et de loisirs***

CS 46 en partie   Professions intermédiaires administratives et commerciales des entreprises
> *sont inclus :*
>> *463a – Techniciens commerciaux et technico-commerciaux, représentants en informatique*
>> *463b – Techniciens commerciaux et technico-commerciaux, représentants en biens d'équipement, en biens intermédiaires, commerce interindustriel (hors informatique)*
>> *463c – Techniciens commerciaux et technico-commerciaux, représentants en biens de consommation auprès d'entreprises*
>> *463d – Techniciens commerciaux et technico-commerciaux, représentants en services auprès d'entreprises ou de professionnels (hors banque, assurance, informatique)*
>> *463e – Techniciens commerciaux et technico-commerciaux, représentants auprès de particuliers (hors banque, assurance, informatique)*

CS 52 en partie   Employés civils et agents de service de la fonction publique
> *à l'exception de :*
>> *525a – Agents de service des établissements primaires*
>> *525b – Agents de service des autres établissements d'enseignement*
>> *525c – Agents de service de la fonction publique (sauf écoles, hôpitaux)*
>> *525d – Agents de service hospitaliers (de la fonction publique ou du secteur privé)*
>> *526e – Ambulanciers salariés (du secteur public ou du secteur privé)*

CS 53 en partie   Policiers et militaires
> *à l'exception de :*
>> *534a – Agents civils de sécurité et de surveillance*
>> *534b – Convoyeurs de fonds, gardes du corps, enquêteurs privés et métiers assimilés (salariés)*

CS 54 en partie   Employés administratifs d'entreprise
> *à l'exception de :*
>> *541a – Agents et hôtesses d'accueil et d'information (hors hôtellerie)*
>> *541d – Standardistes, téléphonistes*
>> ***546b – Agents des services commerciaux des transports de voyageurs et du tourisme***
>> ***546c – Employés administratifs d'exploitation des transports de marchandises***

4 – Small employer and self employed occupations (except for agriculture etc) (Petit bourgeoisie or independents)

CS 21 en grande partie   Artisans
> *à l'exception de :*   ***211j – Entrepreneurs en parcs et jardins, paysagistes***

CS 22 en totalité   Commerçants et assimilés

CS 46 en très faible partie Professions intermédiaires administratives et commerciales des entreprises
> *sont inclus :*
>> *465b – Assistants techniques de la réalisation des spectacles vivants et audiovisuels **(indépendants)***
>> *465c – Photographes **(indépendants)***

5 – Self employed occupations (agriculture etc) (Petit bourgeoisie or independents)

        CS 11 en totalité   Agriculteurs sur petite exploitation (moins de 20 hectares équivalent-blé)

        CS 12 en totalité   Agriculteurs sur moyenne exploitation (de 20 à 40 hectares équivalent-blé et activités assimilées)

        CS 13 en totalité   Agriculteurs sur grande exploitation (40 hectares équivalent-blé et plus)

        CS 21 en très faible partie Artisans

                sont inclus :   ***211j – Entrepreneurs en parcs et jardins, paysagistes***

6 – Lower supervisory and lower technician occupations (Higher grade blue collar workers)

        CS 46 en partie   Professions intermédiaires administratives et commerciales des entreprises

                sont inclus :   *462b – Maîtrise de l'exploitation des magasins de vente*

                                        *465b – Assistants techniques de la réalisation des spectacles vivants et audiovisuels **(salariés)***

                                        *465c – Photographes **(salariés)***

                                        468a – Maîtrise de restauration : salle et service

                                        468b – Maîtrise de l'hébergement : hall et étages

        CS 47 en partie   Techniciens

                sont inclus :   *471b – Techniciens d'exploitation et de contrôle de la production en agriculture, eaux et forêt*

                                        472d – Techniciens des travaux publics de l'État et des collectivités locales

                                        473c – Techniciens de fabrication et de contrôle-qualité en électricité, électromécanique et électronique

                                        474c – Techniciens de fabrication et de contrôle-qualité en construction mécanique et travail des métaux

                                        475b – Techniciens de production et de contrôle-qualité des industries de transformation

                                        476a – Assistants techniques, techniciens de l'imprimerie et de l'édition

                                        476b – Techniciens de l'industrie des matériaux souples, de l'ameublement et du bois

                                        477a – Techniciens de la logistique, du planning et de l'ordonnancement

                                        477b – Techniciens d'installation et de maintenance des équipements industriels (électriques, électromécaniques, mécaniques, hors informatique)

                                        477c – Techniciens d'installation et de maintenance des équipements non industriels (hors informatique et télécommunications)

                                        477d – Techniciens de l'environnement et du traitement des pollutions

                                        478b – Techniciens de production, d'exploitation en informatique

                                        478c – Techniciens d'installation, de maintenance, support et services aux utilisateurs en informatique

                                        478d – Techniciens des télécommunications et de l'informatique des réseaux

        CS 48 en totalité   Contremaîtres, agents de maîtrise

        CS 63 en faible partie   Ouvriers qualifiés de type artisanal

                sont inclus :   ***637b – Ouvriers d'art***

7 – Lower services, sales and clerical occupations (Lower grade white collar workers)

    CS 52 en partie   Employés civils et agents de service de la fonction publique
          sont inclus :   *525a – Agents de service des établissements primaires*
                             525b – Agents de service des autres établissements d'enseignement
                             525c – Agents de service de la fonction publique (sauf écoles, hôpitaux)
                             525d – Agents de service hospitaliers (de la fonction publique ou du secteur privé)
                             526e – Ambulanciers salariés (du secteur public ou du secteur privé)
    CS 53 en partie   Policiers et militaires
          sont inclus :   *534a – Agents civils de sécurité et de surveillance*
                             534b – Convoyeurs de fonds, gardes du corps, enquêteurs privés et métiers assimilés (salariés)
    CS 54 en partie   Employés administratifs d'entreprise
          sont inclus :   *541a – Agents et hôtesses d'accueil et d'information (hors hôtellerie)*
                             541d – Standardistes, téléphonistes
                           546b – Agents des services commerciaux des transports de voyageurs et du tourisme
                           546c – Employés administratifs d'exploitation des transports de marchandises
    CS 55 en totalité   Employés de commerce
    CS 56 en partie   Personnels des services directs aux particuliers
         à l'exception de :   ***561f – Employés d'étage et employés polyvalents de l'hôtellerie***
                           563c – Employés de maison et personnels de ménage chez des particuliers
                           564a – Concierges, gardiens d'immeubles

8 – Lower technical occupations (Skilled workers)

    CS 62 en totalité   Ouvriers qualifiés de type industriel
    CS 63 en grande partie   Ouvriers qualifiés de type artisanal
         à l'exception de :   ***637b – Ouvriers d'art***
    CS 65 en partie   Ouvriers qualifiés de la manutention, du magasinage et du transport
          sont inclus :   *651a – Conducteurs d'engin lourd de levage*
                           651b – Conducteurs d'engin lourd de manœuvre
                           654a – Conducteurs qualifiés d'engins de transport guidés
                           655a – Autres agents et ouvriers qualifiés (sédentaires) des services d'exploitation des transports
                           656a – Matelots de la marine marchande, capitaines et matelots timoniers de la navigation fluviale (salariés)
    CS 69 en faible partie   Ouvriers agricoles
          sont inclus :   *691a – Conducteurs d'engin agricole ou forestier*

9 – Routine occupations (Semi- and non-skilled workers)

   CS 56 en partie   Personnels des services directs aux particuliers

       sont inclus :   **_561f – Employés d'étage et employés polyvalents de l'hôtellerie_**

                   563c – Employés de maison et personnels de ménage chez des particuliers

                   564a – Concierges, gardiens d'immeubles

   CS 64 en totalité   Chauffeurs

   CS 65 en partie   Ouvriers qualifiés de la manutention, du magasinage et du transport

       sont inclus :   *652a – Ouvriers qualifiés de la manutention, conducteurs de chariots élévateurs, caristes*

                   652b – Dockers

                   653a – Magasiniers qualifiés

   CS 67 en totalité   Ouvriers non qualifiés de type industriel

   CS 68 en totalité   Ouvriers non qualifiés de type artisanal

   CS 69 en partie   Ouvriers agricoles

       à l'exception de :   *691a – Conducteurs d'engin agricole ou forestier*