# ANATOMY OF THE ITALIAN OCCUPATIONAL STRUCTURE: CONCENTRATED POWER AND DISTRIBUTED KNOWLEDGE

Armanda Cetrulo, Phd Student Candidate - Scuola Superiore Sant'anna

**Dario Guarascio, Assistant professor at University Rome La Sapienza**

Maria Enrica Virgillito, Assistant Professor at University Milano La Cattolica

**Workshop in onore di Giorgio Lunghini**

**Capitale e lavoro nell'era digitale**

**Ferrara, 5 Novembre 2019**

# OUTLINE

- Introduction
- Theoretical background
- Research Question
- Data
- Analysis and Results
- Conclusions and Future Research

The current debate on the impact of automation on jobs has raised new attention on the relation between “man and machines”, already there since Ricardo.

Interestingly, predictions on the number of potentially displaced jobs change significantly according to the methodology used (Frey and Osborne, 2017; Arntz et al., 2016).

# Different perspectives on labour and organizations (1)

The mainstream approach (David, 2006; Goos et al., 2010) starts from the assumption of **labour as a bundle of tasks and skills**.

Skilled-bias technical change (SBTC) and, later, Routine-bias technical change (RBTC) theories try to explain wage polarization looking at the relationship between the declining price of computers and the increasing demand for skilled labour.

# Different perspectives on labour and organizations (2)

According to our perspective, those approaches disregard the role of ***knowledge*** and the importance of ***division of labour inside organizations.***

✳Workers' activity is not simply a bundle of tasks and skills, but it is the outcome of a process of learning and evolving capabilities, shaped by the emergence of organisational routines, continuously adapting to procedural uncertainty (Dosi et al., 2001).

✳At the same time, the current organisation of work is not the natural reflection of a technical division of labour into different occupations, but rather the byproduct of socio-economic forces (Braverman, 1974, Freeman, 1974, Thompson, 1989).

The goal of this paper is to detect and describe the ***relevant traits*** that could map the anatomy of the Italian occupational structure.

- Main source: **ICP** (Indagine campionaria delle professioni)
- **Database construction**:
  - Conceptual model inspired by the American O*NET.
  - Occupations classification (ISTAT 2011-ISCO 08)
- **Frequency**: 2007, **2012**, 2019 (forthcoming)
- **Sample**: 16.000 workers representing the whole set of Italian occupations. On average 20 workers for each 5-digit occupational code.
  - 1-hour face-to-face interviews with specialized operators - CAPI (Computer Aided Personal Interview)

- **Structure of the Questionnaire:**
  - 10 Thematic sections on **abilities**, **generalized work activities**, **knowledge**, **skills**, **work context** and **style**, (.....)
  - Two scales (**importance*** and level) for the majority of the sections.
  - From almost 800 (5-digit) occupational codes to 9 (1-digit) main groups (ISCO-08).
    - Our unit of analysis: 507 **4-digit** occupational codes.

*Importance Scale: Not important, Barely important, Very important,Of absolute importance

# VARIABLES SELECTION (1)

Multistep procedure:

a) At first, 100 questions*of interest selected from the questionnaire and assigned to three main groups of indicators:
   1) **Knowledge and Learning,**
   2) **Digital Skills,**
   3) **Work Organisation.**

b) Preliminary analysis (mean, standard deviation, pairwise correlation) **for each question** in order to exclude:
   -variables with high degree of overlapping information,
   -variables with very small variance across occupational groups
(suggesting the presence of a systematic bias).

c) Final choice of 25 questions.

* No need for rescaling because all variables have been already rescaled by INAPP researchers from 0-5 scale to 0-100 scale

# VARIABLES SELECTION (2)

| KNOWLEDGE & LEARNING | |
|---|---|
| UPDATE&USE | Keep up to date on technical changes and apply new knowledge |
| CREATIVETHINKING | Develop, design or create new applications, ideas, relationships and new systems and products (including artistic contributions) |
| ACTIVELEARNING | Understand the implications of new information for solving present, future problems and decision-making processes |
| SELECTIVEATTENTION | Ability to focus on a task for a long time without distracting |
| DISTRIBUTEDATTENTION | Attitude to follow two or more different activities or sources of information at the same time |

| DIGITAL SKILLS | |
|---|---|
| PCUSE | Use computers and computer systems (software and hardware) to program, write software, adjust functions, enter data, or process information. |
| ICTKNOW | Knowledge of electronic circuits, processors, electronic equipment chips, computer hardware and software, including knowledge of application packages and programming languages |
| MAILUSE | How often does your profession require the use of e-mail? |

# VARIABLES SELECTION (2)

| | | WORK ORGANISATION |
|---|---|---|
| **AUTONOMY** | | |
| **in decision making** | EVALUATEDECIDE | Evaluate the costs and benefits of possible actions to choose the most appropriate. |
| | GOALSTRATEGIES | Establish long-term goals and specify strategies and actions to achieve them. |
| **in planning** | ORGANIZPRIORITIES | Set specific objectives and plan the work defining priorities, organization and timing of implementation |
| **in doing the job** | SOLVINGCOMPLEXPROBLEM | Identify complex problems and gather useful information to evaluate possible options and find solutions. |
| | SOLVINGPROBLEM | Determine the causes of operating errors and decide what to do to resolve them |
| | TOOLSELECT | Identify the tools necessary for carrying out a job |
| **CONTROL** | | |
| **Control over people/ Power** | LEADERSHIP | The work requires the willingness to guide people, to take charge and to give opinions and directives |
| | INFLUENCE*(average of 2 qs) | In your work what impact have your decisions on and how often do they affect other people or the image or reputation or financial resources of your employer? |
| **Control over the process** | INSPECTING | Inspect equipment, structures or materials |
| | STANDARDSEVALUATION | Evaluate information to determine compliance with standards |
| | CONTROLMACHMPORTANCE | How important is it to keep sequences of machinery and equipment under control? |

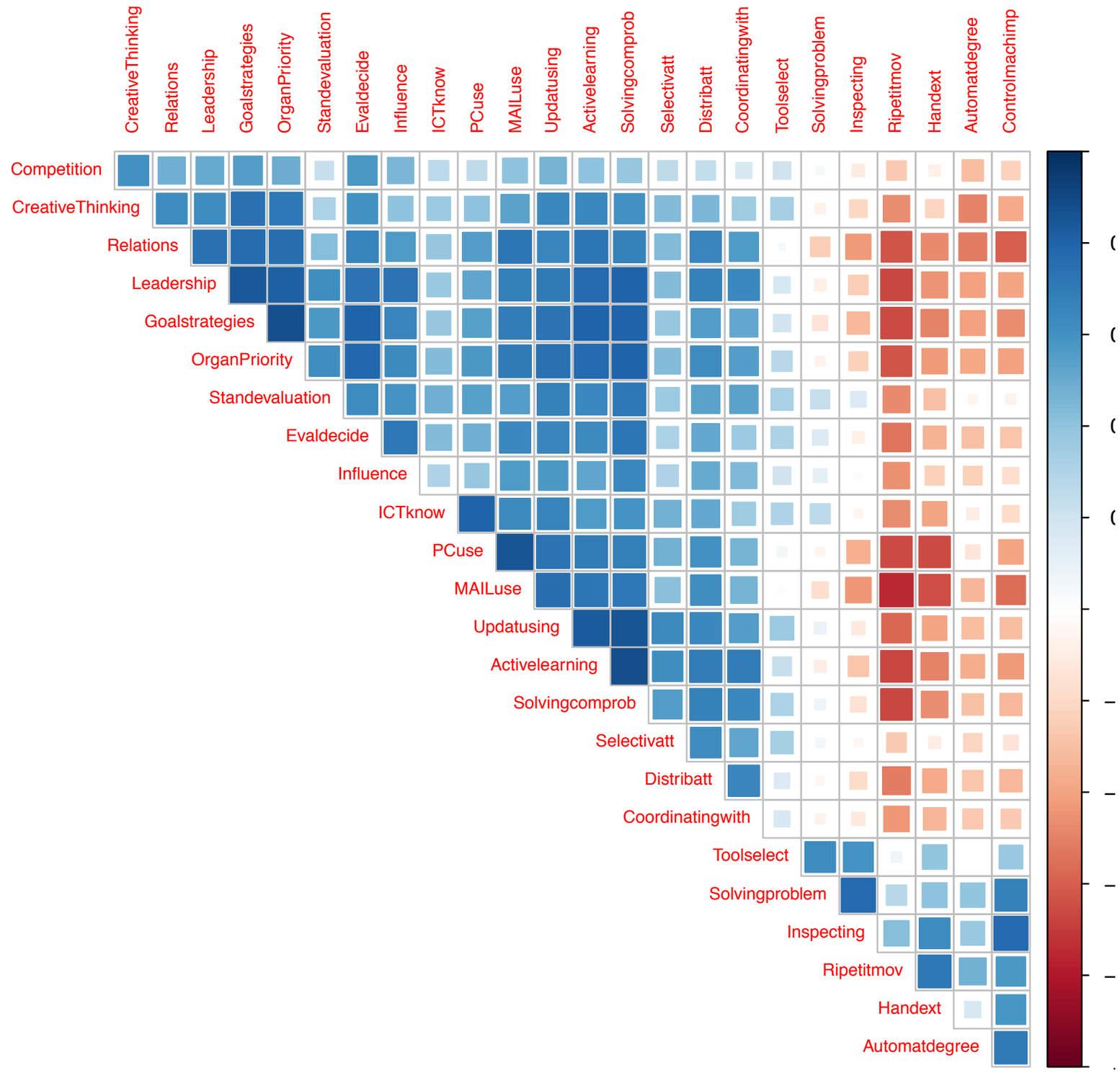
# VARIABLES SELECTION (2)

| | | WORK ORGANISATION |
|---|---|---|
| **SOCIAL CONTEXT** | | |
| **Social organisation structure** | RELATIONS | Establish and maintain interpersonal relationships |
| | TEAMWORKIMPORTANCE | How important it is in carrying out your work to interact in person with work colleagues or to be part of teams or work groups |
| | COMPETITION | How competitive is your job? (requires constant comparison with the performances of colleagues / other workers) |
| **ROUTINARIETY** | | |
| **Routinariety and Automation** | RIPETITMOVEMENTS | In your work how long do you perform repetitive movements? |
| | HANDSDEXTERITY | Aptitude to quickly move the hand, the hand and the arm together or both hands to grasp, manipulate or assemble objects |
| | AUTOMATIONDEGREE | How automated is your work? (linked to automatic processes) |

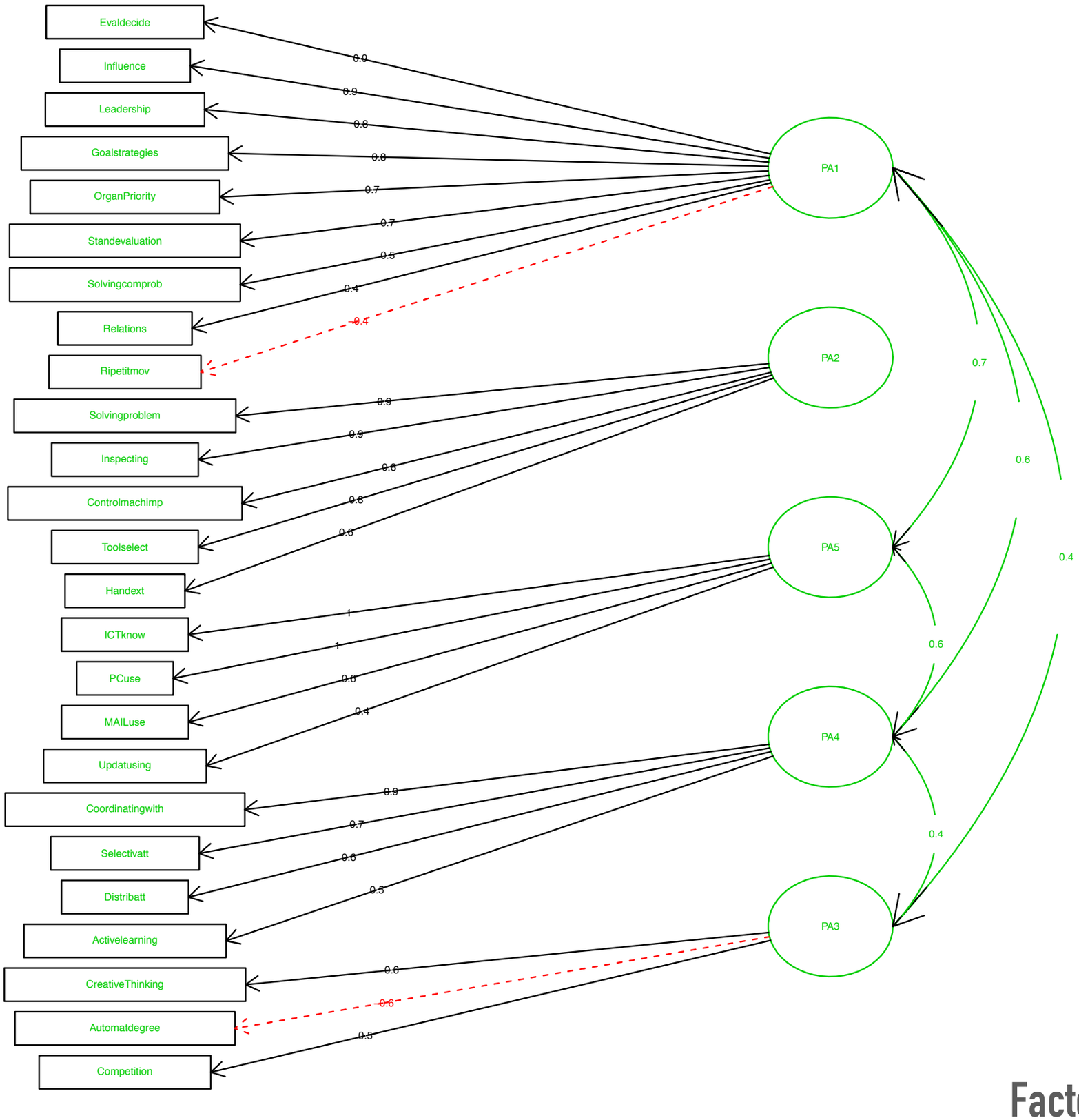
# ANALYSIS

- **Preliminary analysis**
  - Correlation matrix;
  - KMO test and Test on variance homogeneity (Fligner non-parametric test rejects the null);
  - Alpha Conbrach Test for internal consistency.

- **Factor analysis**
  - choice of the number of factors according to the parallel analysis ($n^*=5$), and post analysis on Kaiser's criterion (eigenvalue>1) and variance explained;
  - all the methods of extraction adopted (Minimum residuals, unweighted least squares, **principal axis**) confirm the same result;
  - oblique rotation method allowing for correlation among factors.




# Correlation matrix




## Factor analysis PA – Oblique

Pattern matrix

| | Power | | | | |
|---|---|---|---|---|---|
| Distribatt | 0,17 | | | | |
| Selectivatt | -0,27 | | | | |
| CreativeThinking | 0,29 | | | | |
| Updatusing | 0,26 | | | | |
| Activelearning | 0,32 | | | | |
| PCuse | -0,06 | | | | |
| ICTknow | -0,2 | | | | |
| MAILuse | 0,34 | | | | |
| Evaldecide | 0,95 | | | | |
| Goalstrategies | 0,81 | | | | |
| OrganPriority | 0,7 | | | | |
| Leadership | 0,84 | | | | |
| Influence | 0,91 | | | | |
| Solvingcomprob | 0,54 | | | | |
| Solvingproblem | 0,16 | | | | |
| Toolselect | 0,07 | | | | |
| Ripetitmov | -0,42 | | | | |
| Automatdegree | -0,05 | | | | |
| Handext | -0,29 | | | | |
| Controlmachimp | 0,02 | | | | |
| Standevaluation | 0,68 | | | | |
| Inspecting | 0,11 | | | | |
| Relations | 0,45 | | | | |
| Competition | 0,48 | | | | |
| Coordinatingwith | 0,22 | | | | |
| ProportionVariancce | 0,26 | 0,15 | 0,13 | 0,12 | 0,09 |
| CumulativeVariance | 0,26 | 0,41 | 0,54 | 0,67 | 0,76 |
| ProportionExplained | 0,34 | 0,2 | 0,17 | 0,16 | 0,12 |

Pattern matrix

| | Power | D&CM |
|---|---|---|
| Distribatt | 0,17 | -0,06 |
| Selectivatt | -0,27 | 0,11 |
| CreativeThinking | 0,29 | 0 |
| Updatusing | 0,26 | 0,15 |
| Activelearning | 0,32 | -0,07 |
| PCuse | -0,06 | -0,12 |
| ICTknow | -0,2 | 0,19 |
| MAILuse | 0,34 | -0,22 |
| Evaldecide | 0,95 | 0,19 |
| Goalstrategies | 0,81 | -0,07 |
| OrganPriority | 0,7 | 0,01 |
| Leadership | 0,84 | -0,05 |
| Influence | 0,91 | 0,16 |
| Solvingcomprob | 0,54 | 0,09 |
| Solvingproblem | 0,16 | 0,92 |
| Toolselect | 0,07 | 0,75 |
| Ripetitmov | -0,42 | 0,35 |
| Automatdegree | -0,05 | 0,43 |
| Handext | -0,29 | 0,56 |
| Controlmachimp | 0,02 | 0,8 |
| Standevaluation | 0,68 | 0,3 |
| Inspecting | 0,11 | 0,9 |
| Relations | 0,45 | -0,28 |
| Competition | 0,48 | 0,08 |
| Coordinatingwith | 0,22 | -0,04 |
| | | |
| ProportionVariancce | 0,26 | 0,15 | 0,13 | 0,12 | 0,09 |
| CumulativeVariance | 0,26 | 0,41 | 0,54 | 0,67 | 0,76 |
| ProportionExplained | 0,34 | 0,2 | 0,17 | 0,16 | 0,12 |

Pattern matrix

| | Power | D&CM | Digital |
|---|---|---|---|
| Distribatt | 0,17 | -0,06 | 0,11 |
| Selectivatt | -0,27 | 0,11 | 0,24 |
| CreativeThinking | 0,29 | 0 | 0,07 |
| Updatusing | 0,26 | 0,15 | 0,43 |
| Activelearning | 0,32 | -0,07 | 0,18 |
| PCuse | -0,06 | -0,12 | 0,95 |
| ICTknow | -0,2 | 0,19 | 0,99 |
| MAILuse | 0,34 | -0,22 | 0,57 |
| Evaldecide | 0,95 | 0,19 | 0,03 |
| Goalstrategies | 0,81 | -0,07 | -0,07 |
| OrganPriority | 0,7 | 0,01 | -0,01 |
| Leadership | 0,84 | -0,05 | -0,23 |
| Influence | 0,91 | 0,16 | -0,19 |
| Solvingcomprob | 0,54 | 0,09 | 0,19 |
| Solvingproblem | 0,16 | 0,92 | 0,25 |
| Toolselect | 0,07 | 0,75 | 0,08 |
| Ripetitmov | -0,42 | 0,35 | -0,29 |
| Automatdegree | -0,05 | 0,43 | 0,2 |
| Handext | -0,29 | 0,56 | -0,44 |
| Controlmachimp | 0,02 | 0,8 | -0,11 |
| Standevaluation | 0,68 | 0,3 | 0,1 |
| Inspecting | 0,11 | 0,9 | -0,14 |
| Relations | 0,45 | -0,28 | -0,02 |
| Competition | 0,48 | 0,08 | 0,01 |
| Coordinatingwith | 0,22 | -0,04 | -0,17 |
| | | | |
| ProportionVariancce | 0,26 | 0,15 | 0,13 | 0,12 | 0,09 |
| CumulativeVariance | 0,26 | 0,41 | 0,54 | 0,67 | 0,76 |
| ProportionExplained | 0,34 | 0,2 | 0,17 | 0,16 | 0,12 |

## Pattern matrix

| | Power | D&CM | Digital | Team | |
|---|---|---|---|---|---|
| Distribatt | 0,17 | -0,06 | 0,11 | 0,61 | |
| Selectivatt | -0,27 | 0,11 | 0,24 | 0,71 | |
| CreativeThinking | 0,29 | 0 | 0,07 | 0,02 | |
| Updatusing | 0,26 | 0,15 | 0,43 | 0,27 | |
| Activelearning | 0,32 | -0,07 | 0,18 | 0,49 | |
| PCuse | -0,06 | -0,12 | 0,95 | 0,09 | |
| ICTknow | -0,2 | 0,19 | 0,99 | 0,03 | |
| MAILuse | 0,34 | -0,22 | 0,57 | -0,03 | |
| Evaldecide | 0,95 | 0,19 | 0,03 | -0,26 | |
| Goalstrategies | 0,81 | -0,07 | -0,07 | 0,02 | |
| OrganPriority | 0,7 | 0,01 | -0,01 | 0,14 | |
| Leadership | 0,84 | -0,05 | -0,23 | 0,28 | |
| Influence | 0,91 | 0,16 | -0,19 | 0,02 | |
| Solvingcomprob | 0,54 | 0,09 | 0,19 | 0,33 | |
| Solvingproblem | 0,16 | 0,92 | 0,25 | -0,15 | |
| Toolselect | 0,07 | 0,75 | 0,08 | 0,17 | |
| Ripetitmov | -0,42 | 0,35 | -0,29 | -0,02 | |
| Automatdegree | -0,05 | 0,43 | 0,2 | -0,12 | |
| Handext | -0,29 | 0,56 | -0,44 | 0,09 | |
| Controlmachimp | 0,02 | 0,8 | -0,11 | -0,01 | |
| Standevaluation | 0,68 | 0,3 | 0,1 | 0,27 | |
| Inspecting | 0,11 | 0,9 | -0,14 | 0,06 | |
| Relations | 0,45 | -0,28 | -0,02 | 0,2 | |
| Competition | 0,48 | 0,08 | 0,01 | -0,28 | |
| Coordinatingwith | 0,22 | -0,04 | -0,17 | 0,85 | |
| | | | | | |
| ProportionVariancce | 0,26 | 0,15 | 0,13 | 0,12 | 0,09 |
| CumulativeVariance | 0,26 | 0,41 | 0,54 | 0,67 | 0,76 |
| ProportionExplained | 0,34 | 0,2 | 0,17 | 0,16 | 0,12 |

## Pattern matrix

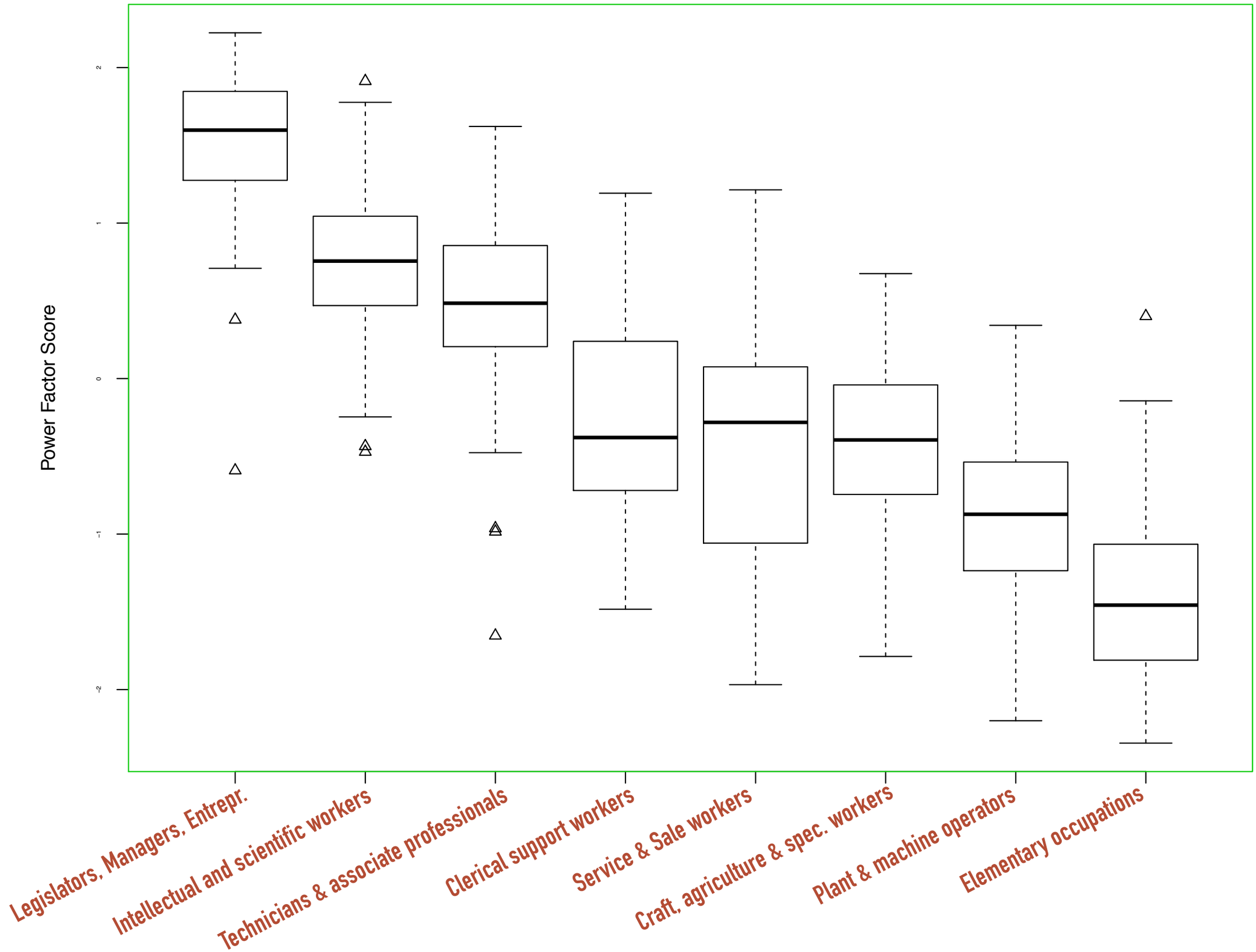
| | Power | D&CM | Digital | Team | Creative | h2 |
|---|---|---|---|---|---|---|
| Distribatt | 0,17 | -0,06 | 0,11 | 0,61 | 0 | 0,65 |
| Selectivatt | -0,27 | 0,11 | 0,24 | 0,71 | 0,19 | 0,65 |
| CreativeThinking | 0,29 | 0 | 0,07 | 0,02 | 0,65 | 0,72 |
| Updatusing | 0,26 | 0,15 | 0,43 | 0,27 | 0,2 | 0,84 |
| Activelearning | 0,32 | -0,07 | 0,18 | 0,49 | 0,09 | 0,86 |
| PCuse | -0,06 | -0,12 | 0,95 | 0,09 | -0,08 | 0,95 |
| ICTknow | -0,2 | 0,19 | 0,99 | 0,03 | 0,07 | 0,78 |
| MAILuse | 0,34 | -0,22 | 0,57 | -0,03 | 0,08 | 0,85 |
| Evaldecide | 0,95 | 0,19 | 0,03 | -0,26 | 0,26 | 0,84 |
| Goalstrategies | 0,81 | -0,07 | -0,07 | 0,02 | 0,26 | 0,87 |
| OrganPriority | 0,7 | 0,01 | -0,01 | 0,14 | 0,23 | 0,81 |
| Leadership | 0,84 | -0,05 | -0,23 | 0,28 | 0,08 | 0,87 |
| Influence | 0,91 | 0,16 | -0,19 | 0,02 | 0,03 | 0,61 |
| Solvingcomprob | 0,54 | 0,09 | 0,19 | 0,33 | 0,02 | 0,86 |
| Solvingproblem | 0,16 | 0,92 | 0,25 | -0,15 | -0,08 | 0,8 |
| Toolselect | 0,07 | 0,75 | 0,08 | 0,17 | 0,31 | 0,71 |
| Ripetitmov | -0,42 | 0,35 | -0,29 | -0,02 | -0,01 | 0,68 |
| Automatdegree | -0,05 | 0,43 | 0,2 | -0,12 | -0,57 | 0,55 |
| Handext | -0,29 | 0,56 | -0,44 | 0,09 | 0,3 | 0,82 |
| Controlmachimp | 0,02 | 0,8 | -0,11 | -0,01 | -0,34 | 0,84 |
| Standevaluation | 0,68 | 0,3 | 0,1 | 0,27 | -0,27 | 0,71 |
| Inspecting | 0,11 | 0,9 | -0,14 | 0,06 | -0,14 | 0,83 |
| Relations | 0,45 | -0,28 | -0,02 | 0,2 | 0,31 | 0,74 |
| Competition | 0,48 | 0,08 | 0,01 | -0,28 | 0,54 | 0,49 |
| Coordinatingwith | 0,22 | -0,04 | -0,17 | 0,85 | -0,18 | 0,71 |
| | | | | | | |
| ProportionVariancce | 0,26 | 0,15 | 0,13 | 0,12 | 0,09 | |
| CumulativeVariance | 0,26 | 0,41 | 0,54 | 0,67 | 0,76 | |
| ProportionExplained | 0,34 | 0,2 | 0,17 | 0,16 | 0,12 | |

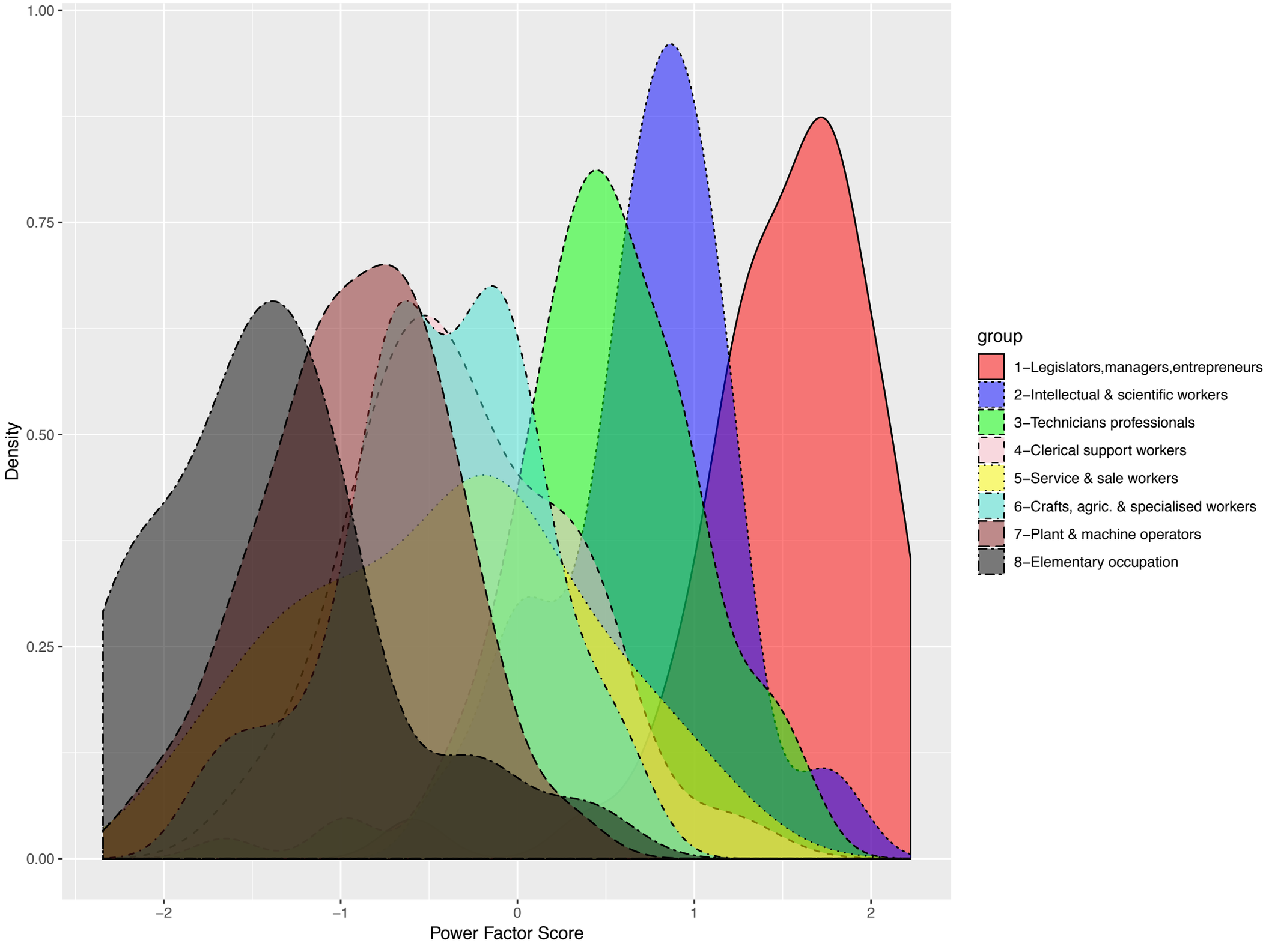
- How do factors distribute across the main occupational groups?
- Two levels of analysis (from micro to macro):
  - micro level: 4-digit top and bottom lists,
  - macro level : factor distribution for the 1-digit main occupational groups.
- Does factor analysis change if we account for contractual categories (autonomous and dependent workers)?

# Power Top & Bottom List (4-digit)

| CP | FS | Occupation |
|---|---|---|
| 1124 | 2,22 | General managers, departmental managers and equivalent directors of state administrations, non-economic public bodies, local authorities, universities, research institutions and health |
| 1121 | 2,22 | Ambassadors, plenipotentiary ministers and senior executives of the diplomatic career |
| 1122 | 2,12 | Government commissioners, prefects and deputy prefects, heads and deputy heads of state police, quaestors, secretaries-general and related professions |
| 1212 | 2,11 | Entrepreneurs and administrators of large companies involved in mineral extraction, |
| 1215 | 2,11 | Entrepreneurs and directors of large companies in accommodation and catering services |
| | | |
| 8421 | -2,34 | Manual workers and unqualified personnel in civil construction and similar professions |
| 8142 | -2,33 | Non-qualified staff in catering services |
| 8152 | -2,27 | Porters and similar professions |
| 7232 | -2,20 | Conductors of machinery for the manufacture of other rubber products |
| 8131 | -2,11 | Freight forwarders and similar workers |

# Main occupational groups

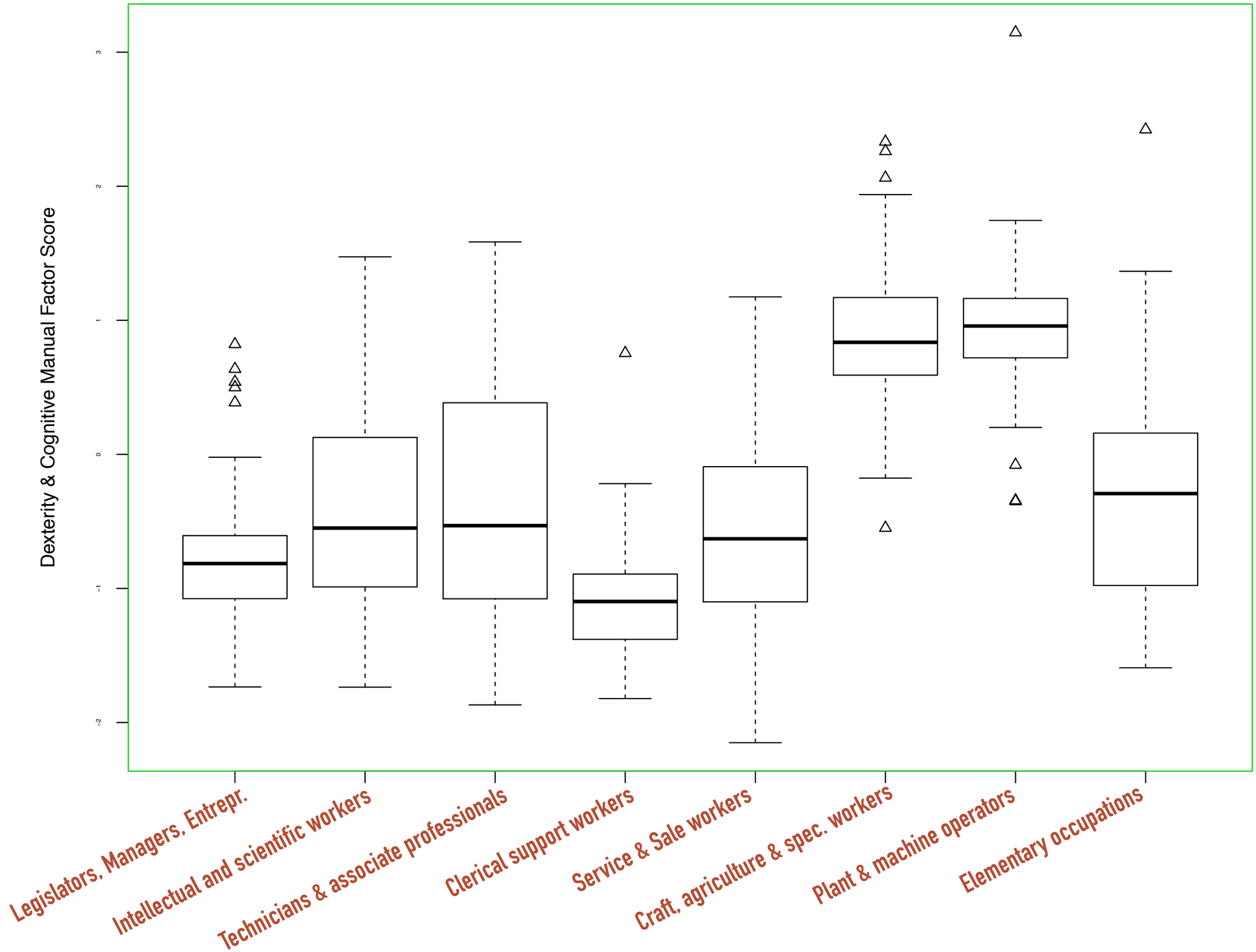


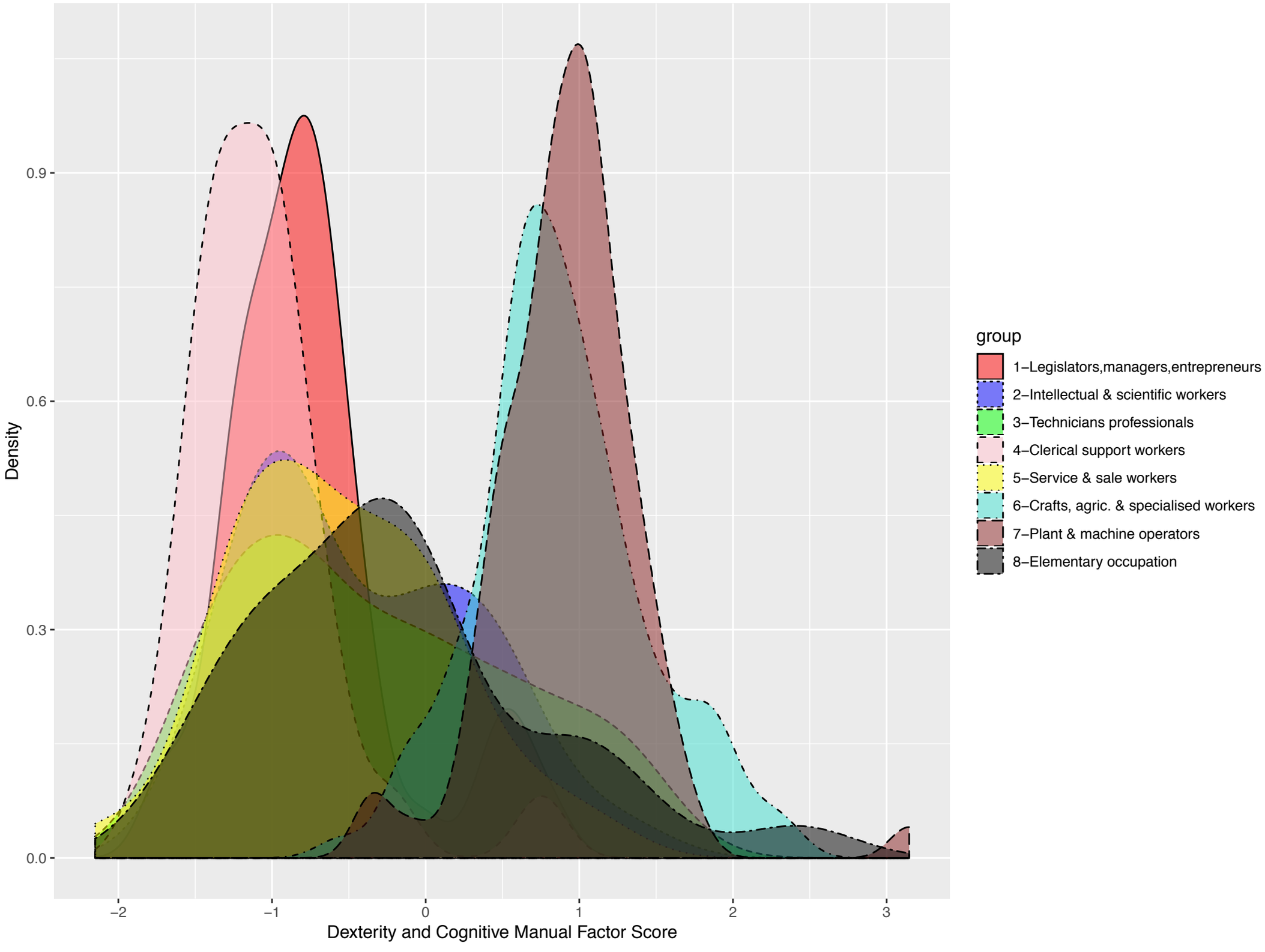

1.00
0.75
0.50
0.25
0.00
Density
−2
−1
0
1
2
Power Factor Score
group
1−Legislators,managers,entrepreneurs
2−Intellectual & scientific workers
3−Technicians professionals
4−Clerical support workers
5−Service & sale workers
6−Crafts, agric. & specialised workers
7−Plant & machine operators
8−Elementary occupation

# Dexterity and Cognitive Manual
# Top & Bottom List (4-digit)

| CP | FS | Occupation |
|---|---|---|
| 7161 | 3,14 | Conductors of steam boilers and heat engines in industrial plants |
| 8323 | 2,42 | Unqualified personnel involved in fishing and hunting |
| 6232 | 2,33 | Engineers and repairers of aircraft engines |
| 6216 | 2,26 | Divers |
| 6238 | 2,06 | Naval mechanics and toolmakers |
| | | |
| 5131 | -2,15 | Models and similar professions |
| 3347 | -1,86 | Agents and representatives of artists and athletes |
| 4321 | -1,82 | Accountants |
| 5125 | -1,74 | Home-based sellers, remote and similar professions |
| 2523 | -1,73 | Notaries |

# Main occupational groups

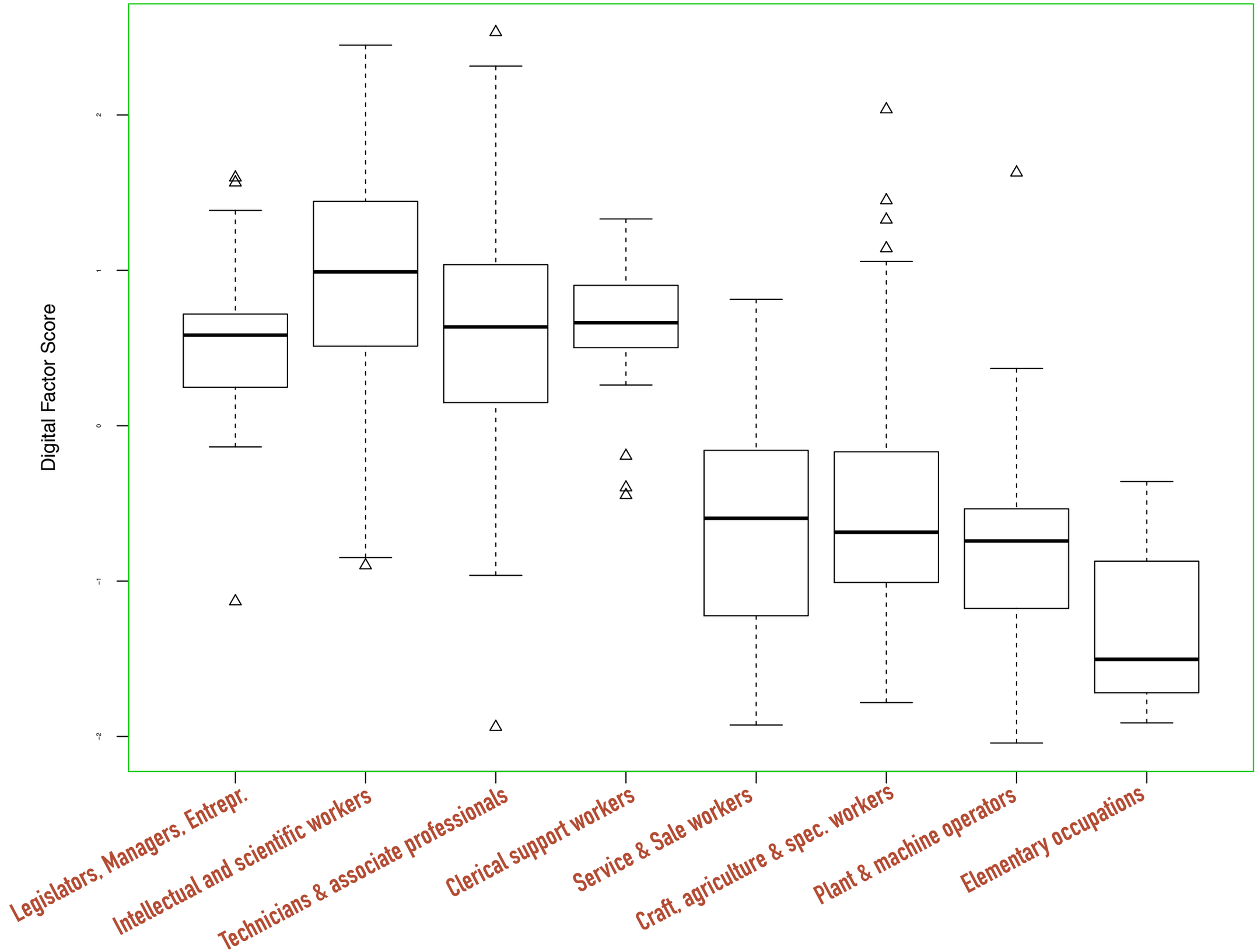


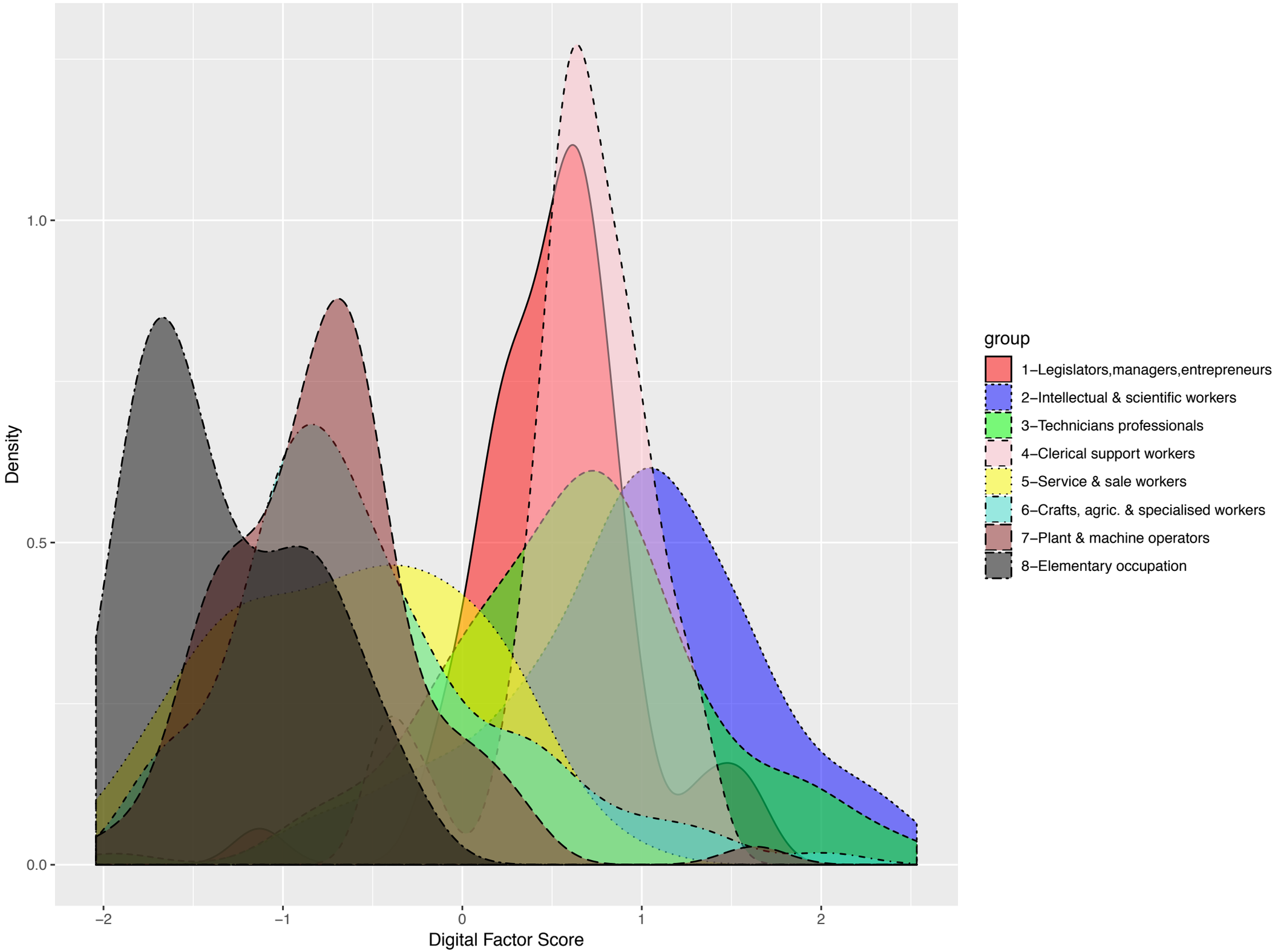

0.9
0.6
0.3
0.0
Density
−2
−1
0
1
2
3
Dexterity and Cognitive Manual Factor Score
group
1−Legislators,managers,entrepreneurs
2−Intellectual & scientific workers
3−Technicians professionals
4−Clerical support workers
5−Service & sale workers
6−Crafts, agric. & specialised workers
7−Plant & machine operators
8−Elementary occupation

# Digital Top & Bottom List (4-digit)

| CP | FS | Occupation |
|---|---|---|
| 3123 | 2,53 | Web technicians |
| 2114 | 2,44 | Analysts and software designers |
| 2214 | 2,32 | Electronic and telecommunications engineers |
| 3125 | 2,31 | Technicians managers of networks and telematic systems |
| 2213 | 2,30 | Electrical engineers |
| | | |
| 7424 | -2,04 | Animal-drawn vehicle drivers |
| 3427 | -1,93 | Athletes |
| 5441 | -1,92 | Company staff and qualified family service staff |
| 8142 | -1,91 | Non-qualified staff in catering services |
| 5487 | -1,91 | Lifeguards and similar professions |

# Main occupational groups

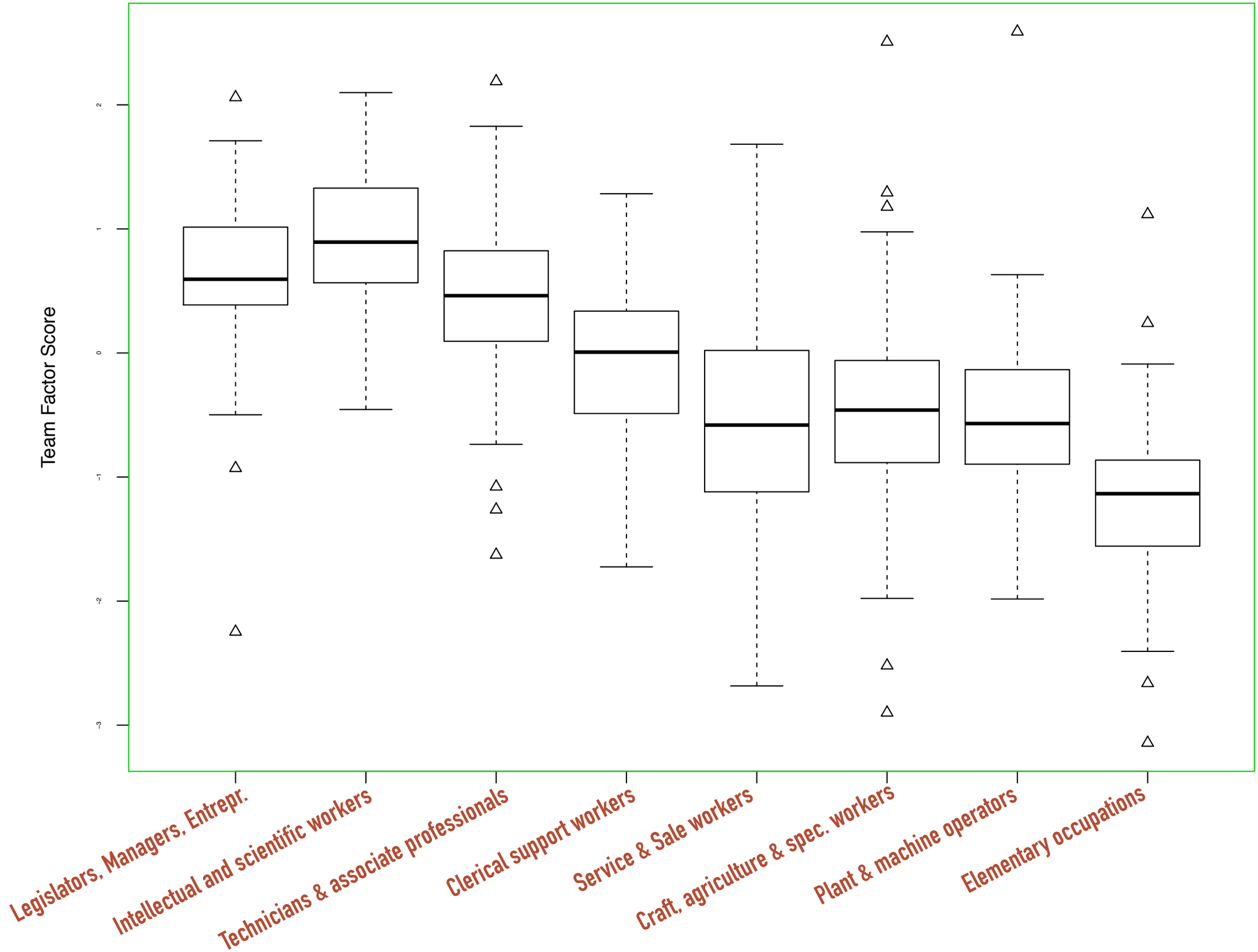


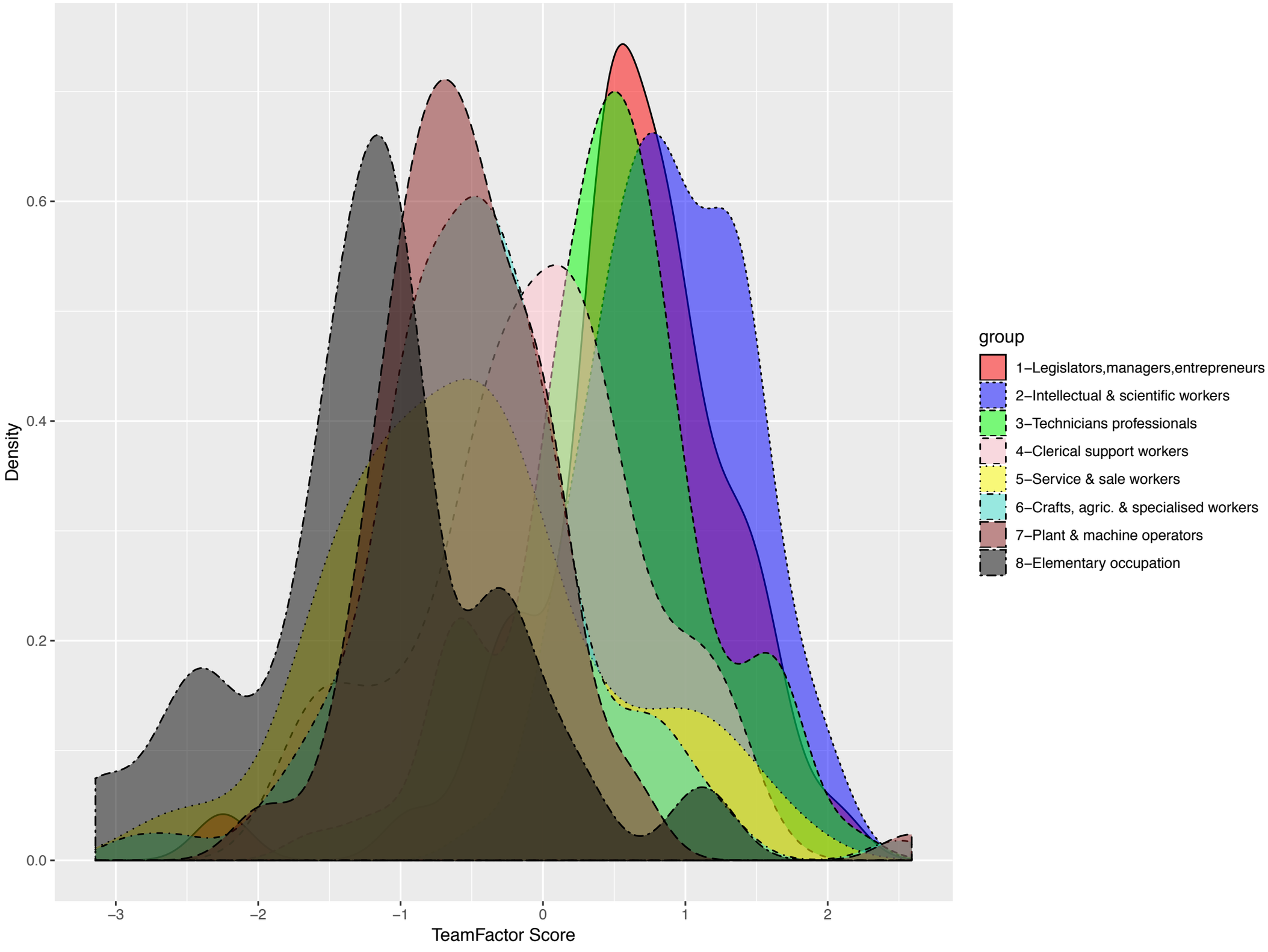

1.0
0.5
0.0
Density
−2
−1
0
1
2
Digital Factor Score
group
1–Legislators,managers,entrepreneurs
2–Intellectual & scientific workers
3–Technicians professionals
4–Clerical support workers
5–Service & sale workers
6–Crafts, agric. & specialised workers
7–Plant & machine operators
8–Elementary occupation

# Team Top & Bottom List (4-digit)

| CP | FS | Occupation |
|---|---|---|
| 7161 | 2,58 | Conductors of steam boilers and heat engines in industrial plants |
| 6232 | 2,50 | Engineers and repairers of aircraft engines |
| 3162 | 2,18 | Pilots of aircraft |
| 2418 | 2,09 | Anaesthetists |
| 1121 | 2,06 | Ambassadors, plenipotentiary ministers and senior executives of the diplomatic career |
| | | |
| 8112 | -3,14 | Walking service providers |
| 6516 | -2,89 | Tobacco leaf preparation and processing workers |
| 5122 | -2,68 | Retail sales clerks |
| 8111 | -2,66 | Street vendors of goods |
| 6422 | -2,51 | Sheep and goat breeders and specialised workers |

# Main occupational groups

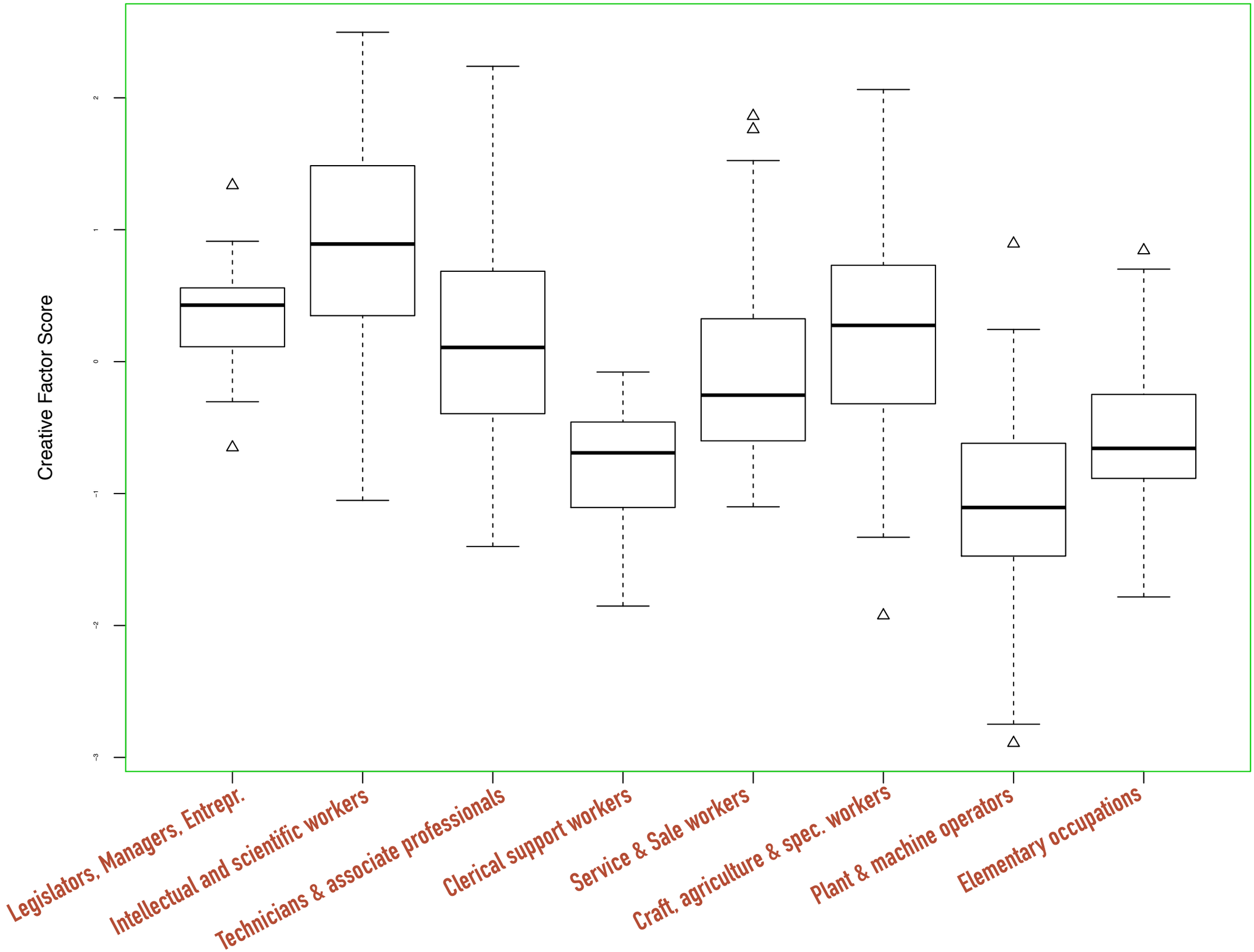


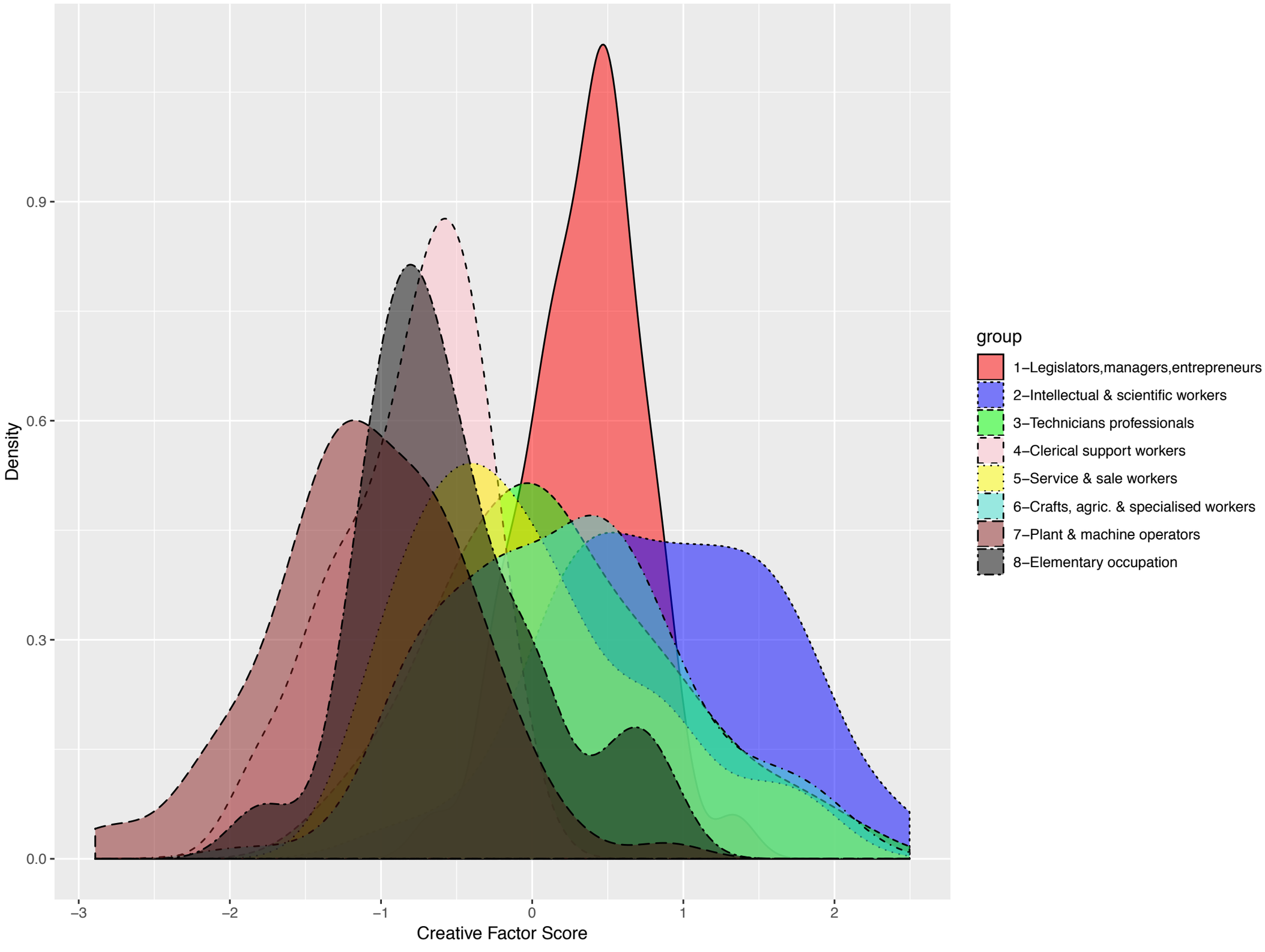

Density
0.6
0.4
0.2
0.0
−3
−2
−1
0
1
2
TeamFactor Score
group
1−Legislators,managers,entrepreneurs
2−Intellectual & scientific workers
3−Technicians professionals
4−Clerical support workers
5−Service & sale workers
6−Crafts, agric. & specialised workers
7−Plant & machine operators
8−Elementary occupation

# Creative Top & Bottom List

| CP | FS | Occupation |
|---|---|---|
| 2555 | 2,49 | Artists of the popular culture, variety and acrobats |
| 2631 | 2,35 | Professors from academies, conservatories and similar educational institutions |
| 2554 | 2,31 | Composers, musicians and singers |
| 3423 | 2,23 | Instructors of techniques in the artistic field |
| 3171 | 2,09 | Photographers and related professions |
| | | |
| 7264 | -2,89 | Workers involved in machinery for the processing of industrial yarns and fabrics |
| 7265 | -2,74 | Workers involved in machinery for printing fabrics |
| 7134 | -2,35 | Conductors of ovens and other plants for the production of bricks, tiles and similar |
| 7325 | -2,21 | Machine operators for the production and refining of sugar |
| 7213 | -2,14 | Machine operators for the production of abrasives and mineral abrasive products |

# Main occupational groups




0.9
0.6
0.3
0.0
Density
−3
−2
−1
0
1
2
Creative Factor Score
group
1−Legislators,managers,entrepreneurs
2−Intellectual & scientific workers
3−Technicians professionals
4−Clerical support workers
5−Service & sale workers
6−Crafts, agric. & specialised workers
7−Plant & machine operators
8−Elementary occupation

# Employees and autonomous workers

We split the overall sample in two sub-samples: **autonomous and dependent workers.**

We opt for a **routine** according to which **if more than 60%** of the 5-digit level occupations are autonomous/dependent, the corresponding 4-digit level will be autonomous/dependent as well. Only 74 out of 507 occupations remain outside this classification.

**Power** is still the most important factor and the main result obtained for all the occupations holds.

**Dexterity & cognitive manual** and **Digital** factors are extracted in both subsamples.

It is nevertheless possibile to observe interoccupational variability, according to the contractual category.

# CONCLUSIONS (1)

- Occupational groups manifest strong heterogeneity in terms of the identified factors.

1. **Power** is strongly uneven distributed. Surprisingly also producers of scientific knowledge have, on average, a low degree of power and autonomy.
2. **Dexterity and Cognitive Manual** highlights the possible coexistence of repetitive activities and complexity in terms of dynamic selection of tools and resolution of unexpected problems.
3. **Digital skills** are concentrated in a rather restricted set of occupations and under-diffused among occupations characterized by a high degree of responsibility and power.
4. In general, collaboration and **team** work is very weak in Italy.
5. Being **creative** is exclusively a feature, on the one hand, of scientists and intellectual workers and, on the other hand, of crafts.

- The Italian occupational structure is strongly hierarchical, with the locus of power distinct by the locus of knowledge generations. It is weak in terms of workers involvements practices and digital skills.

# CONCLUSIONS (2)

- The proposed anatomy of italian occupations underlines elements (such as **power**) usually neglected in mainstream economic theory, and only slightly declined in a significant body of managerial and sociological literature.

- In so doing we expand beyond the atomistic discourse of being skilled-unskilled, or doing routine-nonroutine activities, appropriately considering the role of organizations and hierarchical layers.

# Future lines of research:

- Analyse dynamically the ICP database;
- Study the occupational determinants of income inequalities;
- Investigate the impact of technical change and trade upon work organization.

# THANK YOU
# FOR YOUR ATTENTION!