

Symbolic Analysis of the Time Use in the Basque Country

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Workshop on Symbolic Data Analysis

Lisbon, 26th January 2004

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Outline

- Time Use Survey- EPT 1998
- Symbolic Approach
- Symbolic Visualisation
- Pyramidal Clustering
- Discussion
- References

Time Use Survey-EPT 1998



5040 individuals
(≥ 16 years old)

47 variables



Socio-demographic var.				Time Use var.					
ID	Sex	Age	...	Day	Cleaning	Clothing	Sleep	...	Weight

Time Use Survey-EPT 1998

Activities are divided into:

- *Physiological needs*
- *Work and Studies*
- *Housework*
- *Family care*
- *Social life*
- *Active leisure and Sports*
- *Passive leisure*
- *Travelling*

Time Use Survey-EPT 1998

Time use variables

- **Quantitative:** *time in minutes for each activity.*

- **Qualitative:** *4 modalities:*

1. No participation
2. Scarce participation
3. Medium participation
4. High participation

Symbolic Approach

Symbolic Objects (SO's) are aggregated data concerning groups of individuals that will be treated as new statistical units.

- **Group attribute:** variable(s) to **form** groups

- **Symbolic variables:** variables to **describe** groups



SO₁
SO₂
...
SO_n



Descriptive Statistics
Factorial Analysis
Classification methods
...

Symbolic Approach

Classical Data Matrix

id	Sex	Age	Activity	Sleep	Cooking
1	1	2	1	2	1
2	2	2	3	3	1
3	1	2	1	4	1
4	1	1	1	2	1
5	1	1	1	4	1
6	2	3	3	4	1
7	1	2	1	4	1
8	2	2	1	4	1
9	1	2	1	2	1
10	2	1	3	2	1

Grouped by
sex, age and activity

Symbolic Data Matrix

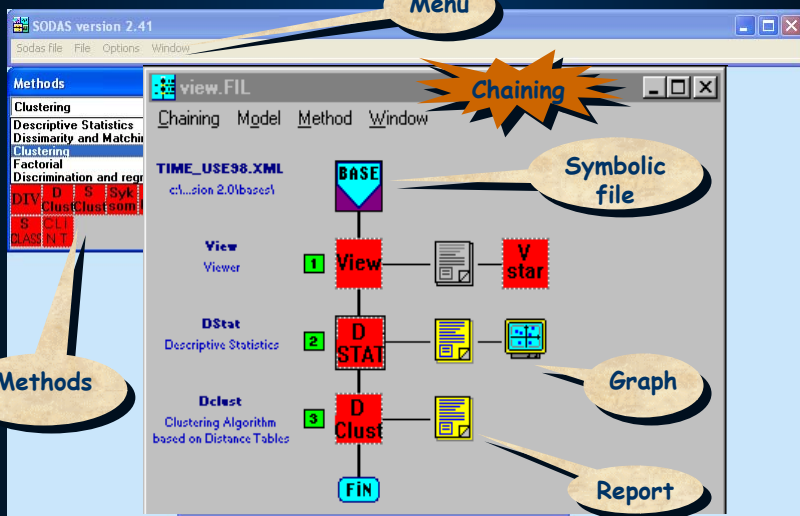
SO₁SO₂

...

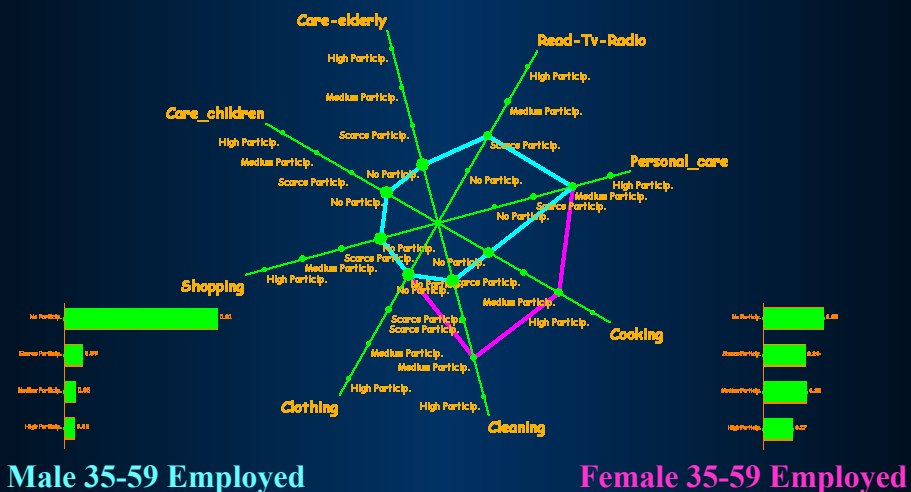
SO₁₈

	Sleep	Cooking
M 35-59 E	Scarce Particip. (0.60), Medium Particip. (0.30), High Particip. (0.10)	No Particip. (0.74), High Particip. (0.01), Medium Particip. (0.06), Scarce Particip. (0.19)
F 35-59 I	Scarce Particip. (0.45), Medium Particip. (0.43), High Particip. (0.11)	No Particip. (0.02), High Particip. (0.74), Medium Particip. (0.21), Scarce Particip. (0.03)
M < 35 E	Scarce Particip. (0.62), Medium Particip. (0.27), High Particip. (0.11)	No Particip. (0.66), High Particip. (0.01), Medium Particip. (0.09), Scarce Particip. (0.24)
F > 59 I	Scarce Particip. (0.19), Medium Particip. (0.37), High Particip. (0.44)	No Particip. (0.09), High Particip. (0.45), Medium Particip. (0.35), Scarce Particip. (0.11)
F < 35 I	Scarce Particip. (0.64), Medium Particip. (0.30), High Particip. (0.06)	No Particip. (0.29), High Particip. (0.29), Medium Particip. (0.20), Scarce Particip. (0.22)
M > 59 I	Scarce Particip. (0.16), Medium Particip. (0.26), High Particip. (0.58)	No Particip. (0.67), High Particip. (0.04), Medium Particip. (0.13), Scarce Particip. (0.16)
F < 35 E	Scarce Particip. (0.45), Medium Particip. (0.37), High Particip. (0.18)	No Particip. (0.22), High Particip. (0.08), Medium Particip. (0.24), Scarce Particip. (0.46)
F 35-59 E	Scarce Particip. (0.71), Medium Particip. (0.24), High Particip. (0.06)	No Particip. (0.09), High Particip. (0.15), Medium Particip. (0.41), Scarce Particip. (0.35)

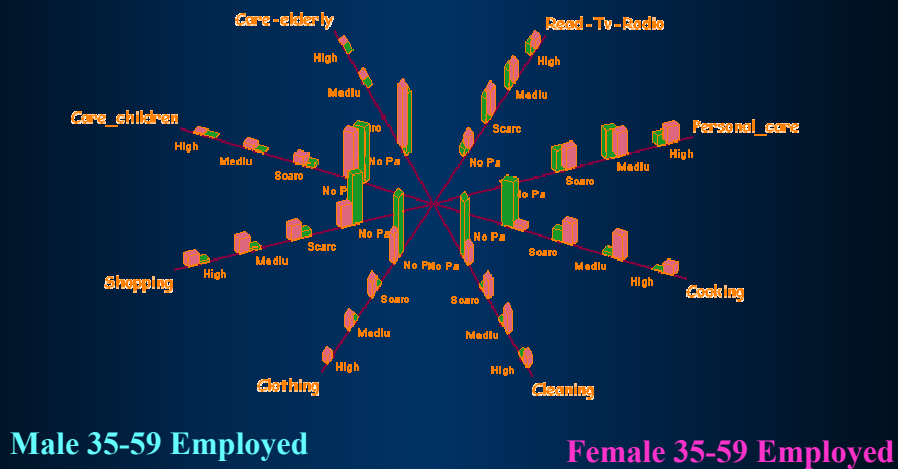
SODAS Workbench



Symbolic Visualisation



Symbolic Visualisation

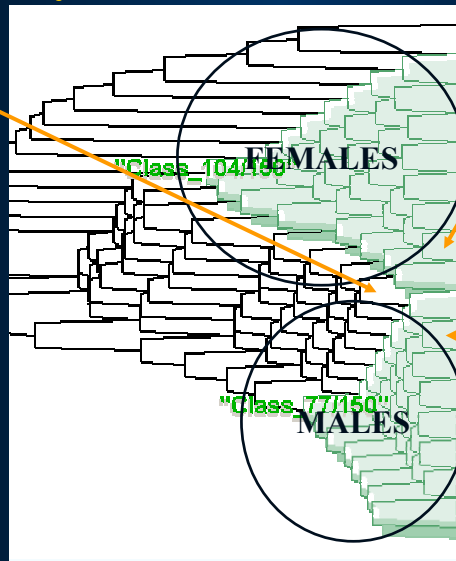


Pyramidal Clustering

Cluster :

Females >59
Employed

Males 35-59
Inactive,



Cluster 4:

Females <35
Employed,

Females <35
Inactive

Cluster 1:

Males 35-59
Employed,

Males <35
Employed

Conclusions

- Symbolic representation: useful approach for exploiting data from large surveys.
- Easy to visually identify group characteristics within and between different surveys.
- Gender differences in time spent in housework activities have been pointed out.

References

- Exploratory Methods for Extracting Statistical Information from Complex Data - BOCK, H.H.; DIDAY, E.; Springer, 2000
- SODAS 2.0 Help Manual
- Download SODAS I and several information
www.ceremade.dauphine.fr/~touati/sodas-pagegarde.htm
- ASSO website
www.assoproject.be
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