

Münsingen-Rain necropolis (Bern, Switzerland). A quantitative study of Late Iron Age fibulae

Thomas Huet

February 2022

Contents

1	Introduction	1
2	Dataset description	2
3	Exploration of the dataset	3
4	Statistical tests	4
5	Conclusion	4
	References	4

In this R Markdown document

- Follow the following comments and delete them once completing the instructions
- For each block of instructions there is an estimation of the average duration
- Do basic improvements for the layouts (colors, size, alignments, etc.), but stay focused on data
- select a dataset from the `{archdata}` package (here: 'Fibulae') - You will have to update the `references.bib` file with your own references

YAML header (10 minutes)

In the above document YAML header

- select your rendering: **pdf_document** or **html_document**
- update the **title** depending on the dataset of `{archdata}` you chose
- update the **author** name

1 Introduction

Markdown (10 minutes)

- Write some three lines for Introduction presenting the dataset using Markdown syntax (e.g. *italic*, **bold**, lists)
- Import a representative picture image (e.g., map, photograph) depending on your topic

Munsingen-Rain is a Late Iron Age necropolis composed of *circa* 220 graves, and 300 bronze and iron fibulae. The necropolis became the favored focus for a wide range of experimental investigations, of a typological, chronological, costume historical, art historical and sociological nature (Müller, Jud, and Alt 2008). Here, we will focus on the statistical analysis of fibulae, exploring the archdata R package (Carlson and Roth 2021) (...)

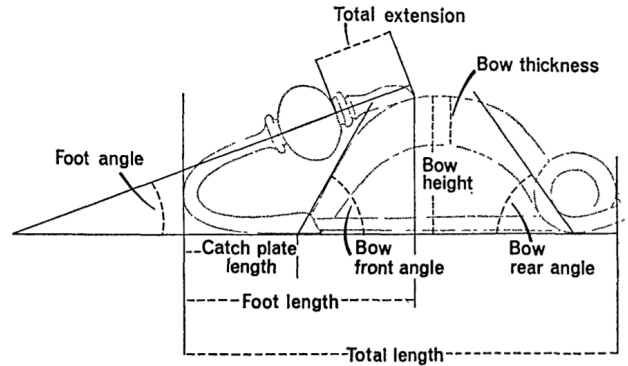


Figure 1: Fibulae measurements (Hodson, 1970)

Hodson (1970) took numerous measurements on the fibulae (Fig. 1). This report aims to realise their statistical analysis (...)

2 Dataset description

Markdown + Descriptive statistics ca (20 minutes)

- Adapt the title
- Compute **descriptive statistics** (e.g. count of rows, count of columns, means)
- Create descriptive plots (e.g. histograms, boxplots, pie charts, scatterplots)
- Comments the results with Markdown text
- Call variables and figures

In the studied dataset, there are 30 fibulae described by 14 quantitative variables (FL, BH, BFA, FA, CD, BRA, etc.) (...)

Table 1: Distribution by quantiles of fibulae measurments

	0%	25%	50%	75%	100%
FL	9.0	19.25	21.50	28.750	94.0
BH	7.0	15.00	15.50	18.000	26.0
BFA	1.0	1.00	2.00	4.000	7.0
FA	6.0	8.00	8.00	9.000	10.0
CD	4.0	6.00	7.00	9.000	16.0
BRA	1.0	1.00	2.00	3.750	7.0
ED	2.0	5.00	8.00	9.750	14.0
FEL	0.0	4.00	7.00	11.000	50.0
C	8.0	11.25	15.00	18.000	50.0
BW	2.0	4.00	5.65	8.175	17.6
BT	1.4	3.05	3.85	4.775	7.7
FEW	0.0	1.90	2.50	3.900	8.6
Coils	3.0	4.00	6.00	6.000	22.0
Length	26.0	41.75	49.50	59.750	128.0

The Tab. 1 resumes the distribution of fibulae measurements by quantiles (...)

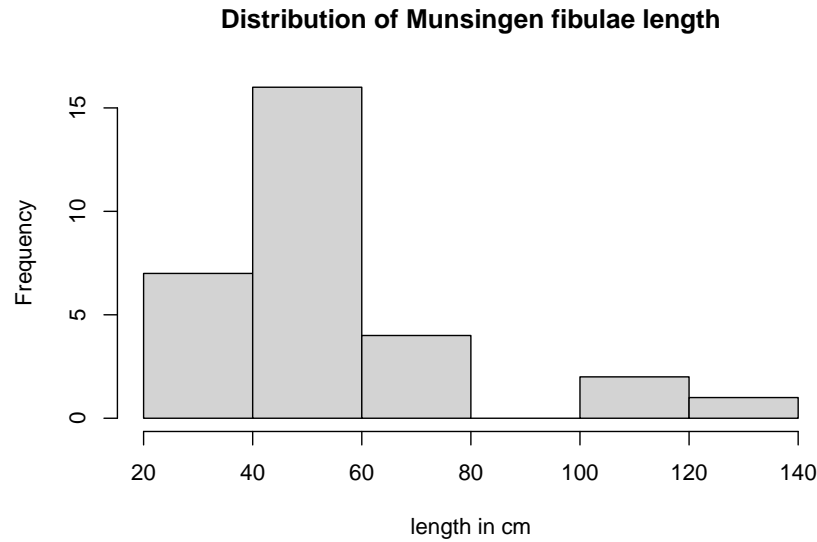


Figure 2: Kernel Density Plot of Length

The histogram of the fibulae length (Fig. 2) shows a ‘L’ shape (...)

3 Exploration of the dataset

Markdown + Exploratory statistics ca (20 minutes)

- Adapt the title
- Compute exploratory analysis (e.g. factorial analysis, hierarchical clustering)
- Comments the results with Markdown text - Call variables and figures

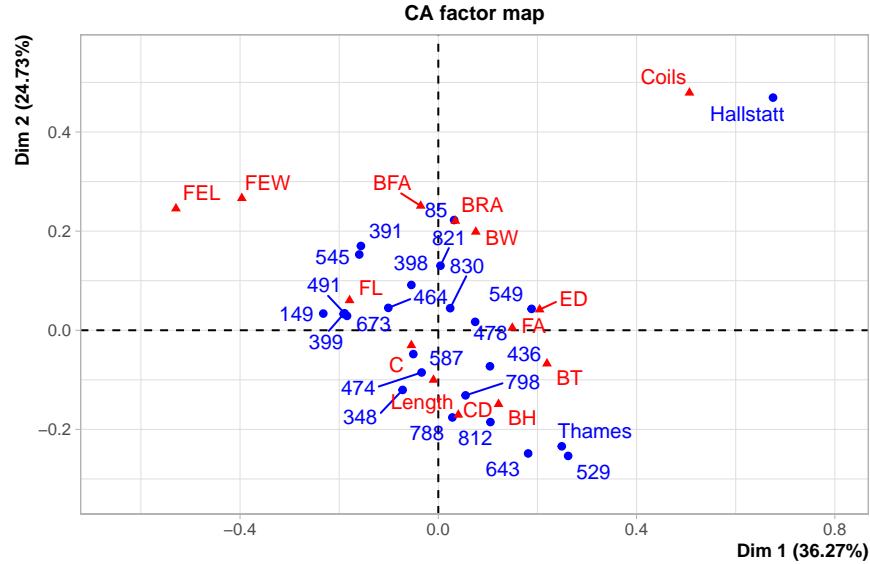


Figure 3: Correspondence Analysis (CA) of the dataset

The Correspondence Analysis (Fig. 3) shows 61 % of the total variance. The point cloud shape is spherical except for one individual (Mno: Hallstatt) and a variable (number of Coils) (...)

4 Statistical tests

Markdown + Confirmatory statistics ca (20 minutes)

- Adapt the title
- Compute **confirmatory analysis** (i.e statistical tests)
- Comments the results with Markdown text
- Call variables and figures

Following the Shapiro-Wilk normality test, the distribution of the fibulae length is not normal as the Fig. 2 shown it. It means (...)

5 Conclusion

Markdown + Variable (15 minutes)

- Write some three lines for Conclusion
- In the YAML header add a new line for an **abstract** and complete it

The statistical analysis of the dataset shows (...)

References

Carlson, David L., and Georg Roth. 2021. *Archdata: Example Datasets from Archaeological Research*. <https://CRAN.R-project.org/package=archdata>.

- Hodson, Frank Roy. 1970. "Cluster Analysis and Archaeology: Some New Developments and Applications." *World Archaeology* 1 (3): 299–320.
- Müller, Felix, Peter Jud, and Kurt W. Alt. 2008. "Artefacts, Skulls and Written Sources: The Social Ranking of a Celtic Family Buried at Münsingen-Rain." *Antiquity* 82 (316): 462–69. <https://doi.org/10.1017/S0003598X00096940>.