

# Counting the Uncountable: A Quantitative Approach to the Religious Differences between the Roman Towns of Emona and Poetovio

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## Abstract

A number of monuments dedicated to deities have been discovered in past years in the area of the Roman towns of Emona and Poetovio. We believe this corpus of monuments reflects the religious background, correlated to the dedications, of both towns. Select statistical methods were used to assess this background, and a neural network was applied for pattern-recognition tasks. A statistically significant difference was proven between the Emona and Poetovio samples, which in our opinion, is related both to the different temporal distribution of selected monuments as well as to the different religious preferences of the dedicators in Emona and Poetovio. The paper aims to point out the advantages and restrictions of a quantitative approach to the study of epigraphic monuments; an approach, we believe, which offers new possibilities for the study of epigraphic data.

*Key words:* quantitative methods, neural network, Roman period, epigraphic data, dedicatory inscriptions, religious background, Emona, Poetovio

“We must compare in order to make distinctions, and distinguish in order to understand.”

Turcan R., 1996

## 1. Introduction

A considerable number of monuments dedicated to various deities have been discovered, collected and interpreted in the past years in the area of the Roman towns of Emona and Poetovio. This paper presents an application of select statistical and pattern recognition methods on the collected corpus of monuments.

Our basic premise is that the preserved corpus of monuments reflects the religious background, correlated to the dedications of Emona and Poetovio. Several questions thus arise. The paper focuses on the following: Is there a discernible difference in the religious backgrounds of both towns? And if so, what is the nature of this difference? What caused it? In an approach to these questions, statistical and pattern recognition methods have been used.

### 1.1. The tale of two cities

The Roman towns, Emona and Poetovio, were located in the territory of present day Slovenia (figure 1): Emona beneath the modern capital, Ljubljana, and Poetovio further eastwards, in the area of modern day Ptuj. There are some similarities between Emona and Poetovio (formerly native settlements, their decline in the fifth century, strong Early Christian communities from the fourth century onward), but the character and evolutionary course of each Roman town was rather different.

*Colonia Iulia Emona* was founded sometime during the course of the Octavian/Augustan period (Šašel Kos 1995). Though several

authors claim that a legionary camp existed in the area before the foundation of the town, this assumption was proven to be ill-founded, supported by neither epigraphic (Šašel Kos 1995) nor archaeological evidence (Plesničar-Gec 1998).

Furthermore, it is not clear whether Emona was founded as a veteran colony. As indicated by inscriptions, it was settled with mainly civilian inhabitants from (mostly northern) Italy, and only sporadically with veterans (Šašel Kos 1995:232). Emona might have been situated in the province Pannonia initially, but it was part of Italy from the second half of the second century onwards at least. The town was quite prosperous from the first to the beginning of fifth centuries. Although it declined after the mid fifth century, sparse habitation obviously continued up to the beginning of the sixth century (Plesničar-Gec 1997).

The town of Poetovio was founded approximately one hundred years later than Emona. During the first century AD, a legionary camp was situated in this area, which was surrounded by a rapidly developing town (*canabae*). *Colonia Ulpia Traiana Poetovio* was, as its name reflects, founded under Traianus, ca. AD 103–106 (Vomer Gojkovič 1996:3), and was situated in the province of Pannonia.

Poetovio witnessed its peak during the second and third centuries (Vomer Gojkovič 1996:3), when it was the residence of the *publicum portorium Illyricum*. Immigrants from northern Italy, retired military personnel from all parts of the empire, especially from the East, and merchants of various ethnic origins all settled in this important economic and financial centre, thus giving Poetovio a rather cosmopolitan character (Šašel Kos 1993:229, 1999:153). As the onomastic study of the material indicates, the native element was pushed more into the background here than in Emona (Šašel Kos 1993:229). The period of prosperity and splendor of the largest Roman town on the territory of present day Slovenia

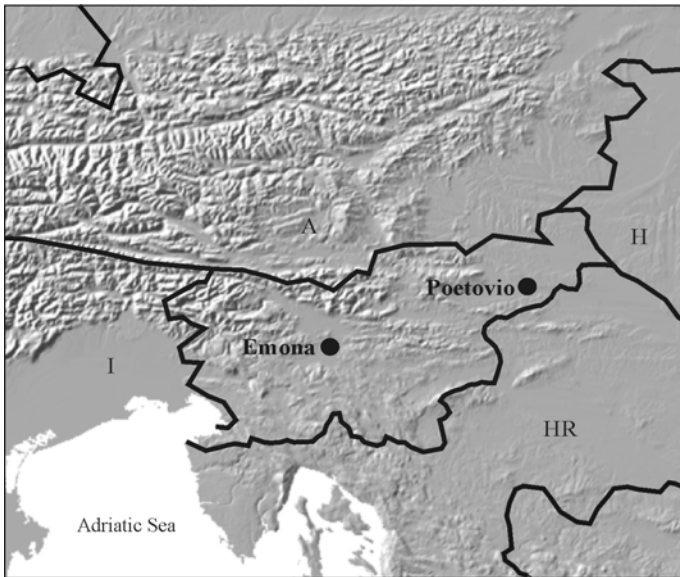


Figure 1: Location of Emona and Poetovio.

was followed by a gradual decline, and after the mid fifth century, the town was almost empty (Horvat 1999:220).

## 2. Counting the uncountable

### 2.1. Database

A relational database of dedicatory inscriptions from both towns (available on request) was created using MS Access 97. Several attributes were recorded for each monument (name of the deity, social class of the dedicator, date and original location of monument, references, etc). The database was built according to several criteria, one being at least partial preservation of the name of the deity, thus allowing for a reliable reconstruction. The dedicator's name was of equal importance for our analysis, as an establishment of her/his social class. Several problems were encountered, mainly due to the fragmented and ill-defined nature of available data. The problems that arose because of indefinite dating were confronted using a probability scheme for dates (figure 2).

Thus, two samples were obtained: one for Emona and one for Poetovio. It should be emphasized that both samples are hardly representative, due to their limited size (77 inscriptions were recorded for Poetovio, and only 23 for Emona) and several biases (depositional and post-depositional processes, collection-related biases).

### 2.2. Looking at patterns

Some basic statistical analyses were applied to both samples, searching for general trends concerning deities, the social class of the respective dedicators and the temporal distribution of monuments.

Among the 24 recorded deities, only five are present in both towns (Aesculapius, Diana, Jupiter, Jupiter Depulsor, and Victoria). The Poetovio sample consists of 77 monuments, of which 67% are dedicated to only three deities (Jupiter, Mithras and Nutrices), while the other deities are represented in less than 5% each. The Emona sample, with only 23 monuments, is much smaller and much more uniform (probably due to the limited size of the sam-

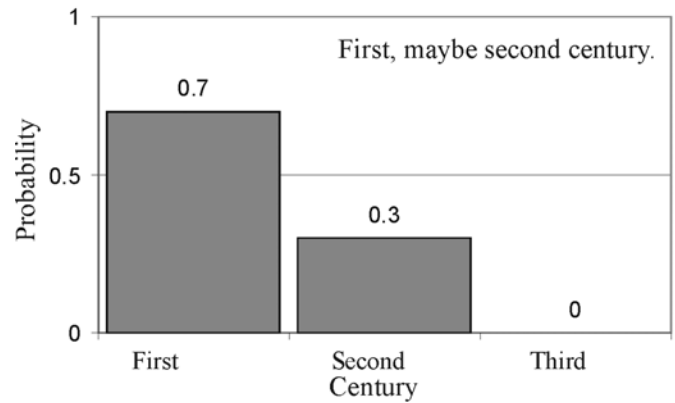


Figure 2: Example of data represented using a probability scheme.

ple): Jupiter 21%, and 13% of Victoria and Aequorna each. Particularly noteworthy are the very similar percentages of monuments that are dedicated to Jupiter in both the Emona and Poetovio samples.

Percentage and numerical diagrams of deities from both towns show considerable differences between the Emona and Poetovio samples (figure 3). A  $\chi^2$  test was carried out to assess this difference (Shennan 1988:65–77). The test proved that the distribution of deities through the Emona and Poetovio samples differed at a significance level of 0.001.

Some similarity is discernible in the social structures of the two towns (figure 4). Roman citizens represent the largest social group in both samples (however, we must point out that they are the most extensive group in the Emona sample anyway). In Poetovio, slaves are a strong group as well. Soldiers are the least represented group; only two were recorded for Emona and 13 for Poetovio.

Regarding the monuments by their respective dates (figure 5), the percentage of monuments in Emona is fairly equal during the first and second centuries, however it sharply declines in the third century. The situation in Poetovio is quite the opposite. The lack of monuments from the first century is followed by their peak in second, and then slight decline in third century. A temporal overlapping between the two samples can only be observed in the second and third centuries.

### 2.3. In search for answers

To clarify the established difference between the Emona and Poetovio samples, we conducted an analysis where the religious preferences of the defined social groups were observed and compared through several centuries. A backpropagation neural network (SNNS v4.1) was chosen (figure 6) as the primary tool in our analysis. A neural network is a computational model consisting of a number of neurodes and the connections between them (e.g. Dobnikar 1990, Kasabov 1996, Looney 1997). Neurodes respond to incoming signals by switching between states, according to the strength of the incoming signal. A neural network has similarities with the human brain: it can learn from experience and it can be thought humanlike reasoning. As such, it is often used for complex pattern-recognition tasks.

As seen above, each town witnessed a high number of various deities; only a selection of deities was represented in both towns

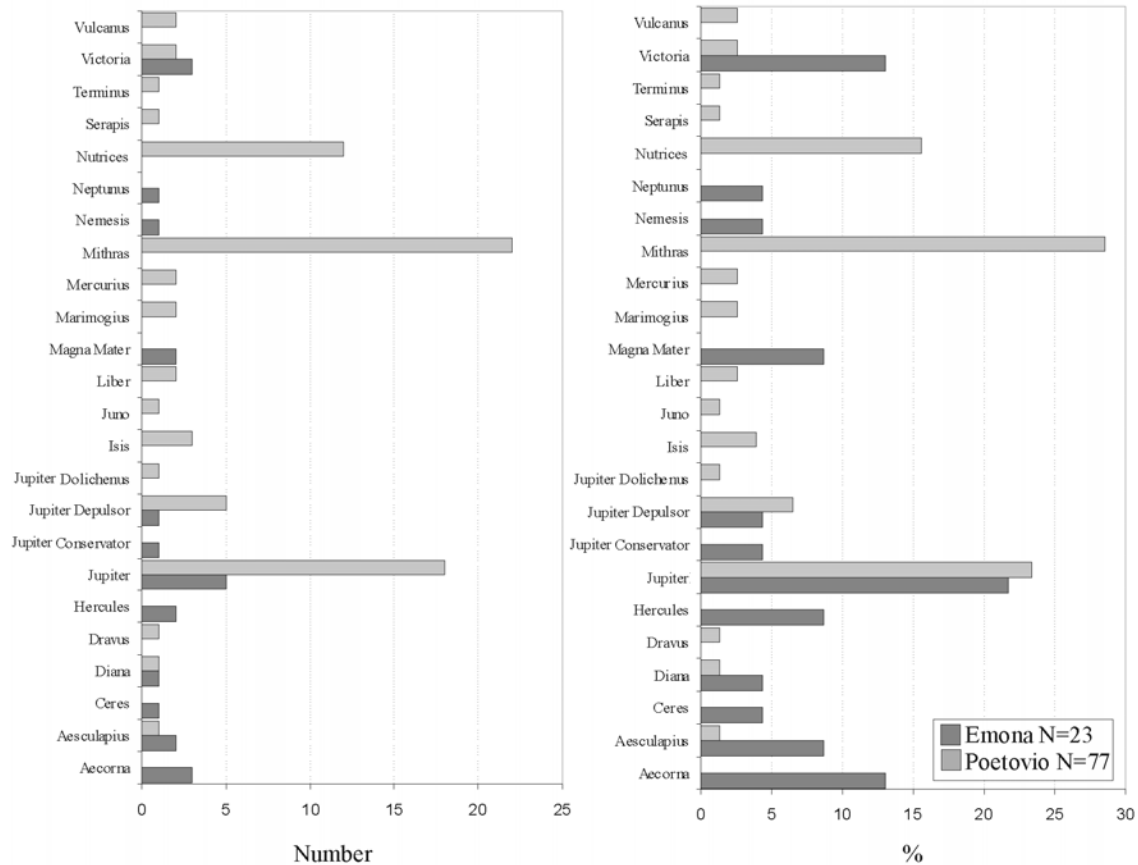


Figure 3: Percentage and numerical charts of deities from both samples.

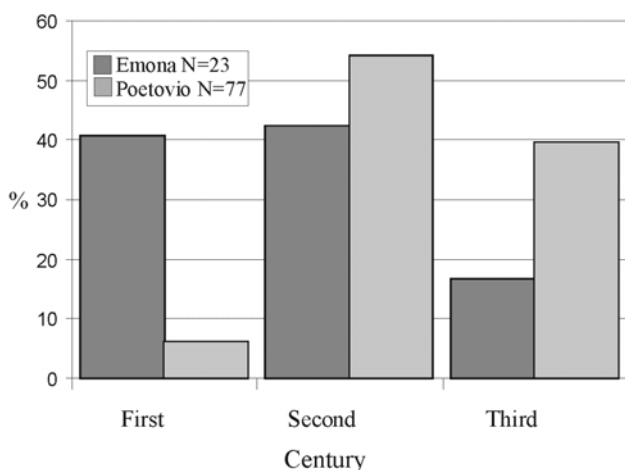


Figure 4: Percentage chart of diverse social groups from both samples.

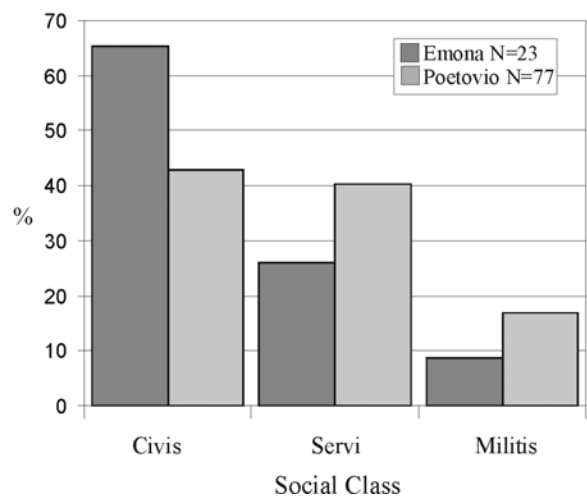


Figure 5: Percentage chart of the temporal distribution of monuments from both samples.

and thus required some classification. Deities were classified according to their respective origins and/or function into the following groups: Roman, eastern and local deities (e.g. Kolšek 1968:273, Belak 1993:233). Syncretistic deities (Jupiter Depulsor, Hercules) were represented using a probability scheme.

Dedicators were then categorized according to their respective social classes. Three categories were chosen to establish a few well-defined groups: citizen, soldier and slave. *Liberti* were included among the latter, their religious background probably not

significantly changed by the transition to a different social class. Veterans were included in the soldier group.

### 2.3.1. Analysis

In the process of preparing the neural network, each town, social class and date were used as input variables. The class of deity was the resulting output variable. "Clear" cases (questions e.g. citizen, first century) were then presented to the neural network, and the following results were observed (figure 7).

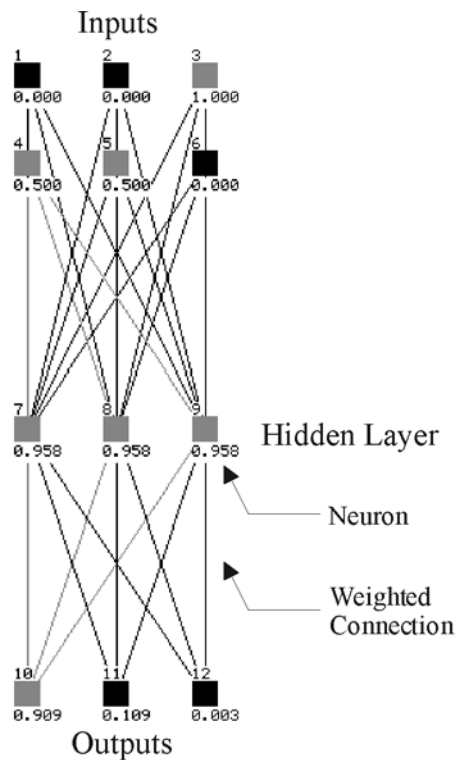


Figure 6: Neural network.

In the Emona sample, citizens in the first century show a fairly equal preference for local and Roman deities, while in the second century, Roman deities are by far preferred. By the third century, the scarce data points towards the growing popularity of the local deities. One obvious conclusion is the relative unpopularity of eastern deities among the Roman citizens in Emona.

As for slaves, chiefly Roman deities are preferred in Emona during the first two centuries, whereas an increasing popularity of local deities is detectable in the third century. As among the citizens of Emona, eastern deities were also quite unpopular among Emona slaves.

The soldier group in the Emona sample is by far too small to allow any conclusions to be made.

The citizens of Poetovio held Roman deities in the highest esteem in the second century, with local and eastern deities coming in second place. In the third century, eastern deities are first in line, with local following and Roman far behind.

The ratio of local deities worshipped by the slave class in Poetovio is similar during both the second and third centuries. The ratio of eastern deities then rises in the third century, and the Roman one declines.

Soldiers show a similar interest in local cults in both the second and third centuries. Their interest in Roman deities considerably lessens in the third century, which is when soldiers from the Poetovio sample favour eastern deities.

The second century is marked by a high preference for Roman deities in both samples, whereas the preference for the Roman deities abruptly declines in the third century and prevails for local deities in Emona and eastern deities in Poetovio. The preference for local deities in the Poetovio sample remains at a constant level throughout the second and third century. Eastern deities were obviously never of marked importance in Emona, however they are

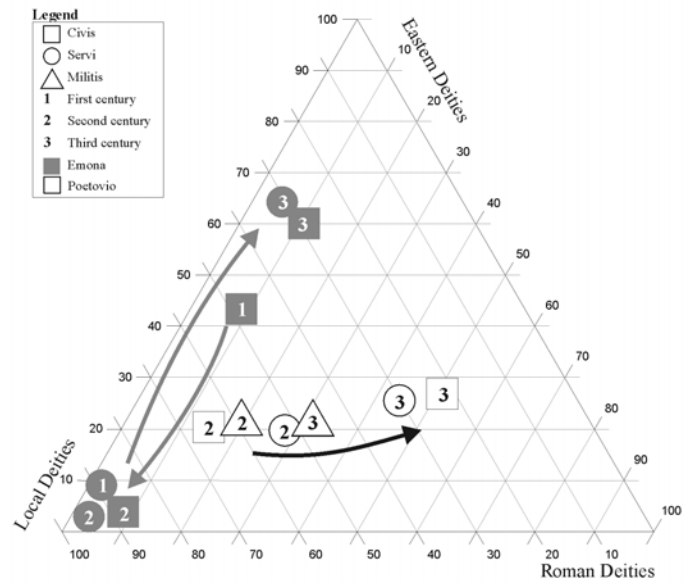


Figure 7: Analysis results.

well represented in the second century Poetovio sample and predominate almost unanimously in the third century.

### 2.3.2. Discussion

The religious backgrounds of both towns, as reflected in the preserved corpus of dedicatory monuments, differ significantly.

We are tempted to interpret the difference in their sample sizes as a reflection of the different populations in both towns. However, it could also be a result of varying religious habits in the local tradition, or simply an echo of diverse economic backgrounds, where stone monuments were affordable only to members of economically select groups.

The temporal distribution of monuments from Emona and Poetovio is also different. The observed temporal distribution suggests the peak of dedicative religious activity in Emona during the first century, slowly diminishing afterwards; while in Poetovio, the peak of such activity is demonstrated in the second century. We believe that the general temporal distribution of the analyzed monuments most probably reflects the different evolutionary courses of each town, as is also advocated by archaeological evidence.

A general decrease in the popularity of Roman deities in third century can be observed among slaves and citizens in both towns. However, this uniform decrease was obviously compensated diversely, as the sample from Emona shows an increase in local cults and the sample from Poetovio an adoption of eastern cults. The latter remain quite unimportant in Emona, their scant number consisting mainly of Egyptian deities. We are inclined to interpret the Poetovio sample as a reflection of the increased importance of Poetovio during the second and third centuries, as well as of the corresponding influx of new inhabitants with a predominantly eastern religious background.

Another interesting pattern is the considerable popularity of local cults among Emona citizens during the first century. It decreases severely in the second century, however, not among the Emona slaves, where local cults retain constant, though low, popularity. Again, we emphasize that all results obtained using the Emona sample are hardly representative due to the limited sample size.

### 3. Conclusions

The present exercise aims at pointing out the advantages and restrictions of a quantitative approach in studying epigraphic monuments; it is an approach, which we believe offers a range of new possibilities in studying epigraphic data. Select statistic analyses were applied to samples of dedicatory inscriptions from Emona and Poetovio, and a neural network was used for pattern-recognition tasks. The principle problem encountered was that of sample size. As for the results, a statistically significant difference between the samples from Emona and Poetovio was observed, which is in our opinion related both to the different temporal distribution of selected monuments and to the diverse religious preferences of dedicators in Emona and Poetovio.

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