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AGE ROUNDING AND SOCIAL STATUS IN NORICUM*

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Abstract. *This survey concerns the age rounding process in the Latin epitaphs of Noricum. In the first part of the study we analysed the age rounding process differentiated by gender, the data obtained being compared with the existing ones from the other Danubian provinces. The second part concerns the age rounding process differentiated in terms of legal status by using Whipple's Index. The proportion of rounded ages–unrounded ages is overwhelming for both female and male population in Noricum. In terms of legal status, the peregrini/ae features the category with the highest tendency towards rounded digits followed by citizens (male and female) and soldiers.*

Rezumat. *Acest studiu privește procesul de rotunjire al vârstelor în inscripțiile funerare latine din Noricum. În prima parte a studiului am analizat procesul de rotunjire al vârstelor diferențiat pe sexe, datele obținute comparandu-le cu cele deja existente pentru celelalte provincii dunărene. Cea de-a doua parte a studiului vizează procesul de rotunjire diferențiat pe categorii juridice prin prisma indexului lui Whipple. Proporția vârste rotunjite-vârste exacte este covârșitoare, atât pentru populația feminină, cât și pentru cea masculină din Noricum. Din punct de vedere al statutului juridic, peregrinii reprezintă categoria cu cea mai mare tendință spre cifrele rotunjite, fiind urmați de cetățeni și militari.*

Age rounding is a demographic phenomenon peculiar to many traditional societies from all historical eras, encountered from industrialization to modernization — it has only disappeared during the contemporary period. This phenomenon also appeared during the 20th century. Census-

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returns from developing countries frequently showed a predominance of ages reckoned in fives or tens. The true proportion of individuals with ages reckoned in fives in any population must normally be about one-fifth of the total (20%)[2]. We often find a much higher proportion than 20% reported in age-figures for developing countries. For instance, in the Turkish census of 21 October 1945, 58% of all adults have their age as a multiple of five years[3]. The usual reason for the deviation observed in modern censuses is ignorance of exact age; the innumeracy suggested by age rounding was probably one reflection of the reduced educational opportunities also reflected in illiteracy. Statistics from developing countries in the twentieth century allow quotients for age rounding and for illiteracy to be juxtaposed (Table 1).

Place and date of census	Rounding (ages 23–62)		Excess female rounding (percentage)	Illiteracy from age 15 (percentage)	
	Male	Female		Male	Female
Egypt 1947	74.9	80.4	7.3	68.5	91.3
Morocco 1960	53.1	67.4	26.9	78.1	94.0
Iran 1966	35.8	44.2	23.5	67.2	87.8
Iraq 1957	26.1	32.2	23.4	76.1	94.7
Nicaragua 1963	22.6	24.0	6.2	49.9	50.8
Turkey 1965	21.8	42.6	95.4	35.5	72.6
Guatemala 1950	20.9	32.3	54.5	65.6	75.6
Ceylon 1963	19.5	27.6	41.5	14.6	36.1
Mexico 1970	12.7	16.0	26.0	20.6	27.0
Brazil 1950	10.5	12.9	22.9	45.2	55.8

Table 1. Age rounding and illiteracy in 20th century censuses

[2] DUNCAN-JONES 1977, 333.

[3] Methods of Appraisal of Quality of Basic Bata for Population Estimates (Manuals on methods of estimating population, no. II, United Nation ST/SOA Series A, Population Studies no. 23) 1955, 35, 41.

In one of his books, Walter Scheidel stated: "in pre-industrial societies past and present, the capability of stating one's age or the age of an adult family member with precision, or even the mere wish to do so, cannot be taken for granted. In many cases, ages would be given in approximations focusing on a restricted range of conventional numbers such as multiple of five and ten. It has long been acknowledged that in this respect the Roman Empire is no exception"[4]. In Roman evidence, age declarations by the same individual at different dates typically show internal discrepancies, which are sometimes serious. A case in point is Aurelius Isidorus of Karanis in Egypt, a prosperous landowner of the time of Diocletian, who declared to be 35 in April 297, 37 in April 308, 40 in August 308, 45 before June 309, and 40 in June 309[5] (ages reported in documents preserved in his family archive shown in Table 2). Egyptian parallels suggest that this case was not at all unusual[6] (Table 3). Most of the ages in these three examples are multiple of 5. What lay behind the round numbers was guesswork by the individual.

Age-declaration	Implied birth-year	Discrepancy with preceding date
35 April 297	262	-
37 April 308	271	+ 9 years
40 August 308	268	- 3 years
45 pre–June 309	264 (or earlier)	- 4 years
40 June 309	269	+ 5 years

Table 2. Age reporting by Aurelius Isidorus

Age-declaration		Discrepancy with previous age
(A)	36 on 25 October 107 BC	-
	30 on 16 August 104	- 9 years
	35 on 12 April 101	+ 2 years

[4] SCHEIDEL 1996, 53.
[5] DUNCAN-JONES 1977, 334.
[6] DUNCAN-JONES 1990, 80.

	40 on 18 November 99	+ 3 years
(B)	45 on 27 February 310 AD	-
	50 on 3 April 317	- 2 years
	58 on June 327	- 2 years
	58 in October 328	- 1 year

Table 3. Other conflicting age declarations in Egypt

Nevertheless, the historians who studied demography warned that this might have been an exception, not the rule. In this article, we will try to determine whether there is a tendency for age rounding—by gender and social status—in Noricum.

This demographic phenomenon has been in the attention of classical antiquity historians starting with the end of the 19th century, with the articles of Albert Granger Harkness[7] and Wilhelm Levison[8]. More than half a century later, when the demographic studies on the Roman Era were resumed, age rounding came back to the researchers' attention through the articles of András Mócsy[9], János Szilágyi[10], Richard P. Duncan-Jones[11] and Walter Scheidel[12]. For Danubian provinces, the problem was treated by Lucreţiu Mihailescu-Bîrliba (as single author or together with Valentin Piftor and Răzvan Cozma)[13] and Valentin Piftor.

In their studies of age awareness in the Roman Empire, Levison and Mócsy simply divided ages not divisible by 5 by ages divisible by 5[14], and Mócsy did not distinguish between the sexes, and used all age evidence from 20 upwards[15]. Duncan-Jones was the only one who tried,

[7] HARKNESS 1896, 35-72.
[8] LEVISON 1898, 1-82.
[9] MÓCSY 1966, 387-421
[10] SZILÁGYI 1961, 125-155; 1962, 297-396; 1963, 129-224; 1965, 302-334; 1966, 235-277; 1967, 25-59.
[11] DUNCAN-JONES 1977, 333-353; 1979, 169-177.
[12] SCHEIDEL 1996, 53-93.
[13] MIHAILESCU-BÎRLIBA 2001, 87-102; 2004, 32-33, 38-40; MIHAILESCU-BÎRLIBA, PIFTOR, COZMA 2007, 17-21, 27-31; PIFTOR 2009, 33-36, 44-47; PIFTOR 2013, 87-114.
[14] SCHEIDEL 1996, 54.
[15] DUNCAN-JONES 1977, 334, note 7.

starting from the data provided by Mócsy and Szilágyi, to offer a complete picture of age rounding in the Latin-speaking half of the Empire. His survey is based on more than 40,000 extant epitaphs (with age at death of the deceased) from the western half of the Empire and mainly belonged to the first three centuries A.D. He adopted a new statistical approach, due to the weaknesses of the aggregative method used by Mócsy and Levison, and he made a more extensive social and regional analysis of the Roman evidence. Nevertheless, except for Scheidel, nobody analysed this issue at the level of a single province, and Scheidel chose as province the Roman Egypt, the only part of the ancient world which yields age data from different types of sources in sufficient number to permit comparative analysis and evaluation. He had focused on comparably large and homogeneous samples of evidence which were compiled from census returns, tax lists, tombstones, mummy labels, records of legal transactions, and lists of public officials. His study is carried out on a total of 2136 ages of individuals aged 10–69 years, 1860 of which concern persons who are between 20 and 69 years (1.437 men – 1.301 are 20–69 years old, and 517 women – 388 are 20–69 years of age).

We will use Whipple's Index to calculate age rounding. The formula is applied to a restricted age-range selected by the U.S. Census Bureau for studying excess representation figures in the U.S. Census of 1910. The range comprises 40 years stretching from 23 to 62 inclusive[16]. Analysis is restricted to this age span in order to exclude children and juveniles, the precise ages of whom are likely to be remembered by their parents, as well as elderly people among whom an approximate and even increasingly symbolic expression of age becomes the norm. The interval is divided into four decades. The index-figures for rounding are calculated as follows. A separate percentile analysis has been made of the proportion of ages divisible by 5 in each of the four decades. We subtract 20 from the percentage obtain within a decade and we multiply the result by 1.25[17]. Scheidel states that Whipple's Index is based on two questionable

[16] WHIPPLE 1923, 180–181.
[17] DUNCAN-JONES 1977, 337.

assumptions. The first is that the number of ages in each ten-year range must be equal, which is clearly not the case in any actual population, and second — that within each decade, the classification by digits must be equal (each digit must represent 10% of the sample per decade). For the first assumption—that there should be an equal number of persons in each series—to be true, birth rate should be constant (in pre-industrial societies, famine, epidemics and war would cause considerable but irregular fluctuations in the birth rate). In addition, life expectancy should be rather high, mostly that this situation is not present in the contemporary societies, either. As concerns the second assumption, it is hard to believe that the same number of persons died at 23 and at 32, and this situation occurs in all decades[18].

Our analysis was performed on a sample consisting of 934 individuals: 351 females, 555 males, and 28 persons whose gender could not be determined, from funerary stones dating since the first three centuries of our era, for the province of Noricum.

In the first part, we will analyse the ratio between rounded ages and unrounded ages at the level of the entire sample. In the case of the females in Noricum, the ratio is found in Figure 1.

Of the 351 persons within the female sample, 180 have the age ending in digit 0 (51.28%), 111 (31.62%) have the age ending in another digit, and only 60 persons (17.10%) have the age ending in the digit 5. The percentage of females with unrounded ages in Noricum (31.62%) is the lowest compared to the other Danubian provinces: Dacia – 47%[19], Pannonia Inferior – 42%[20], Moesia Inferior – 41.67%[21], Moesia Superior – 36.55%[22] and Pannonia Superior – 34.6%[23]. In regard to the ages with digits ending in 0, the sample in Noricum (51.28%) is lower than that of Moesia Superior – 51.72%, but higher than that of Pannonia Superior – 48.2%,

[18] SCHEIDEL 1996, 54.
[19] MIHAILESCU-BÎRLIBA 2004, 31,
[20] MIHAILESCU-BÎRLIBA, PIFTOR, COZMA 2007, 48–49.
[21] PIFTOR 2012, 80.
[22] PIFTOR 2012, 24,
[23] MIHAILESCU-BÎRLIBA, PIFTOR, COZMA 2007, 16–17.

Dacia – 39%, Moesia Inferior – 37.96% and Pannonia Inferior – 37%. In the case of ages ending in the digit 5, Noricum has a higher value (17.10%) than Dacia – 14% and Moesia Superior – 11.72%, but slightly lower than Pannonia Inferior – 21%, Moesia Inferior – 20.37% and Pannonia Superior – 17.20%.

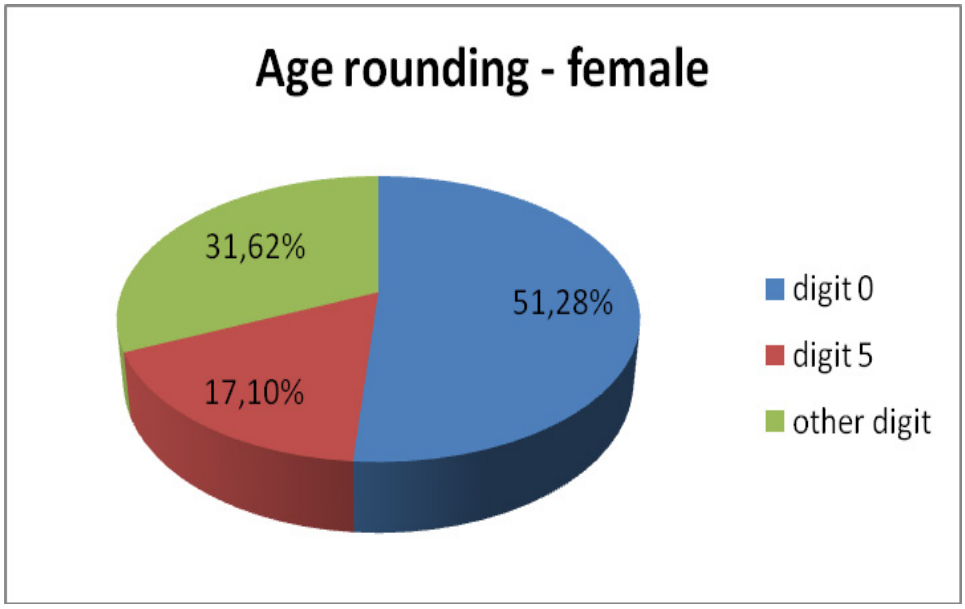

Figure 1. Age rounding in Noricum (females).

Table 4 captures the distribution of unrounded ages by age categories, as indicated in funerary inscriptions.

Age category (years)	Number of unrounded ages
1–4	21
6–9	14
11–14	10
16–19	19
21–24	15

26–29	5
31–34	12
36–39	6
41–44	0
46–49	2
51–54	4
56–59	0
61–64	2
66–69	0
71–74	0
76–79	0
81–84	0
86–89	0
91–94	0
96–99	0
101–104	1
106–109	0
111–114	0
116–119	0

Table 4. Classification of unrounded ages by age categories

We noticed a concentration of unrounded ages in the first part of the female sample, which includes the categories of children and young people. 64 of the 111 persons with an unrounded age lived until 20, meaning 57.65%, 102 of the 111 until 40 (91.89%) and 108 of the 111 until 55, meaning 97.29%. After this age, only 3 mentions of unrounded ages

were recorded, which shows that people had better memory concerning the persons who died younger.

In some epitaphs we can find people with ages clearly expressed. In the female sample in Noricum (Table 5), the precisely indicated ages (the exact number of months and days lived by the deceased) are mentioned, for the most part, up to 25 years; we are talking about girls and young women commemorated mainly by their parents. Lasciva lived 1 year and 5 months[24], [---]muna lived 2? years, 11 months and 3 days[25], a child whose name has not been preserved lived 3 years and – months[26] (the number of months is not readable), Capra lived 5 years, 11 months and 13 days[27], Finita died at 6 years and 5 days[28], Baebia Secunda lived 16 years and 8 months[29], Vibenia Ursa – 23 years, 5 months and 3 days[30], Ulpia Afrodisia – 25 years and 1 month[31]. The highest age pinpointed with months and days is that of Sextila, commemorated by her husband at 30 years, 2 months and 11 days[32].

Name of the deceased	Age (years)	Legal status	Name of the dedicators	Legal status	Kinship	Source
Lasciva	1 y, 5 m	Citizen	Secundinius Ursinus	Citizen	Grandfather	ILLPRON 208
[---]muna	2? y, 11 m, 3 d	Citizen	-	Citizens	Parents?	ILLPRON 644
Anonymous	3 y, - m	-	-	-	-	RIS 220

[24] ILLPRON 208.
[25] ILLPRON 644.
[26] RIS 220.
[27] AE 1974, 485.
[28] ILLPRON 674.
[29] ILLPRON 655.
[30] ILLPRON 197.
[31] ILLPRON 1684.
[32] ILLPRON 442.

Capra	5 y, 11 m, 13 d	Slave	Hermia-nus	*Scrutator stationis Bilachinie nsis*	Father	AE 1974, 485
			Leontia	Slave	Mother	
Finita	6 y, 5 d	*Peregri-na*	Satullus	*Peregrini*	Father	ILLPRO N 674
			Finita	*Peregri-na*	Mother	
Baebia Secunda	16 y, 8 m	Citizen	Baebius Secundus	Citizen	Father	ILLPRO N 655
			Accepta	*Peregri-na*?	Mother	
			Cassius Ingenuus	Citizen	Husban d	
Vibenia Ursa	23 y, 5 m, 3 d	Citizen	Paternus	*Peregrini*	Hus-band	ILLPRO N 197
Ulpia Afrodisia	25 y, 1 m	Citizen	-	-	Parents?	ILLPRO N 1684
Sextilia	30 y, 2 m, 11 d	*Peregri nae*	Valenti-nius Ingenuus	Citizen	Hus-band	ILLPRO N 442

Table 5. Persons with precisely-indicated ages
in the female sample in Noricum

If we analyse the dedicators of the inscriptions belonging to the 9 females, the following situation appears: from the total of 5 persons under 16 years old – 3 have their parents as dedicators, one is commemorated by her grandfather and in 1 case the dedicator is unknown; the four under 35 years old have as dedicators: 1 – the parents and her spouse, 1 – the parents and 2 – the spouse. In addition, 6 of the 9 cases are represented by persons under 18 years old, which shows that, in the case of young persons, the dedicators were more aware of the exact age. If we analyse the legal status of the deceased, we notice that 5 of them are citizens, 2 are *peregrinae*, one is a slave and one has an undetermined legal status.

As concerns the rounded ages, their distribution by age categories is shown in Table 6.

Age category (years)	Number of rounded ages
5	6
10	6
15	3
20	31
25	15
30	38
35	18
40	32
45	2
50	28
55	5
60	23
65	5
70	7
75	4
80	8
85	1
90	3
95	1
100	3
105	0
110	0
115	0
120	1

Table 6. Classification of rounded ages by age categories

If most of the unrounded ages were recorded for ages under 25, most of the rounded ages are recorded for ages starting from 30 years old—179 persons of 240—meaning 74.58%. Most rounded ages are at 30 (38 persons), 40 (32 persons), 50 (28 persons), 60 (23 persons), 70 (7 persons), 80 (8 persons), 90 (3 persons), 100 (3 persons), meaning 59.16% of the rounded ages and 40.45% of the overall female sample. Of the 38 cases of females deceased at 30 years old from Noricum, in 12 cases the spouse is the dedicator, in 16 cases the females are commemorated by their parents (both parents – 7 cases; the father – 8 cases; the mother – 1 case), in 4 cases

the dedicators are unknown, three females are commemorated by their heirs – *heres* (one of them, Fuscia Secunda, is commemorated by her children – *heredes pudenti matri fecerunt*[33]), in one case the grandfather, in one case the sibling and in another case there is no mention of the type of relation between the dedicator and the deceased. This may indicate that their relatives no longer remember the age at death, but they believe that the females have reached a certain maturity without having children and tent to associate this phenomenon with the age of 30[34].

In the case of male population in Noricum, the ratio between rounded ages and unrounded ages can be seen in the Figure 2.

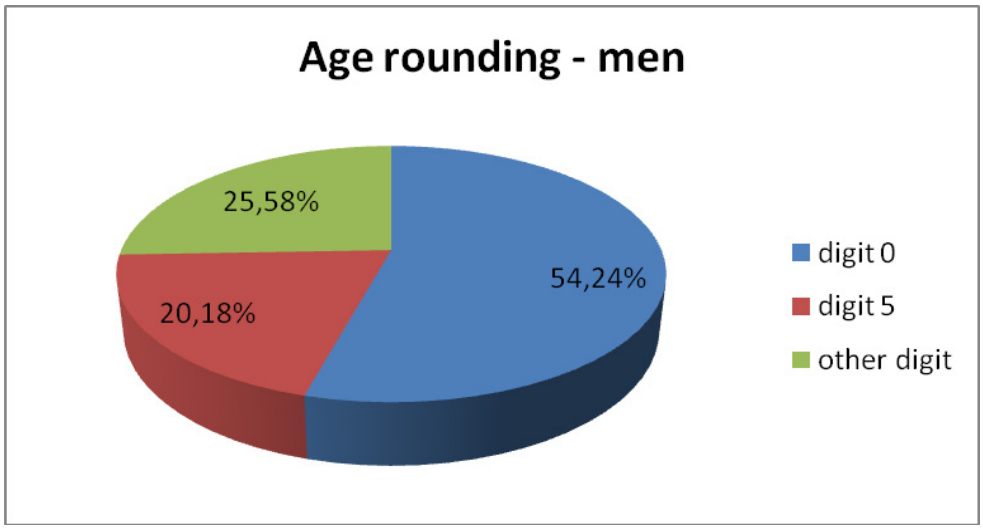

Figure 2. Age rounding in Noricum (males).

In Noricum there are 301 persons (54.24%) with the age ending in the digit 0; 142 (25.58%) have the age ending in another digit, and only 112 (20.18%) have the age ending in the digit 5. The percentage of male with accurate ages in Noricum (25.58%) is the lowest compared to the other Danubian

[33] ILLPRON 1547.
[34] MIHAILESCU-BÎRLIBA 2006, 128.

provinces: Pannonia Inferior – 44%[35], Dacia – 42%[36], Moesia Inferior – 39.03%[37], Pannonia Superior – 33.5%[38] and Moesia Superior – 32.14%[39]. In the case of ages ending in the digit 0, Noricum has the highest percentage among all the Danubian provinces – 54.24%, unlike the other provinces: Pannonia Superior – 45.4%, Moesia Inferior – 44.61%, Moesia Superior – 44.16%, Dacia – 42% and Pannonia Inferior – 41%. In regard to the ages with digits ending in 5, the percentage in Noricum (20.18%) is lower than that of Pannonia Superior – 21.1% and Moesia Superior – 23.7%, but higher than that of Moesia Inferior – 16.36%, Dacia – 16% or Pannonia Inferior – 15%.

As in the case of the female population in Noricum, there are precisely indicated ages (the exact number of months and days lived by the deceased). Babies (an anonymous dead at the age of 8 months[40]), toddlers (like Primus – lived 2 years, - months and 16 days[41] and [---]us Valens – 2/3 years, 2 months and 2 days[42]) and children (such as [---]ius – 7 years, 3 months and 16 days[43]) are those whose age of death is precisely indicated and, moreover, in all four cases the dedicators are the parents, meaning the persons who know better the ages of their children. As regards the legal status, both the deceased and the dedicators are citizens.

Name of the deceased	Age (years)	Legal status	Name of the dedicators	Legal status	Kinship	Source
Anonymous	8 m	Citizen?	L(ucius) Celerius Campester	Citizen	Father	ILLPRON

[35] MIHAILESCU-BÎRLIBA, PIFTOR, COZMA 2007, 57.
[36] MIHAILESCU-BÎRLIBA 2004, 38–39.
[37] PIFTOR 2012, 99.
[38] MIHAILESCU-BÎRLIBA, PIFTOR, COZMA 2007, 27.
[39] PIFTOR 2012, 43.
[40] ILLPRON 21.
[41] ILLPRON 169.
[42] ILLPRON 1356.
[43] ILLPRON 1356.

			Celeria Primigenia	Citizen	Mother	21
Primus	2 y, - m, 16 d	Citizen?	C(aius) Anto[nius] Quintianus	Citizen	Father?	ILLPRON 169
[---]us Valens	2/3 y, 2 m, 2 d	Citizen	M(arcus) Fidelis	Citizen	Father?	ILLPRON 1356
[---]ius	7 y, 3 m, 16 d	Citizen				

Table 7. Persons with precisely indicated ages in the male sample in Noricum

Table 8 captures the distribution of unrounded ages by age categories, as indicated in funerary inscriptions.

Age category (years)	Number of unrounded ages
0–1	4
1–4	14
6–9	32
11–14	13
16–19	21
21–24	16
26–29	8
31–34	6
36–39	2
41–44	2
46–49	6
51–54	5
56–59	5
61–64	4
66–69	1
71–74	2
76–79	0
81–84	1

86–89	0
91–94	0
96–99	0
101–104	0
106–109	0
111–114	0
116–119	0

Table 8. Classification of unrounded ages by age categories

The unrounded ages of death are crowded in the first part of the male sample, which includes the categories of children and young people. Thereby, 100 ages of 142 (70.42%) are listed by the age of 25 years, 114 of 142 by the age of 35 years (80.28%), 118 of 142 by the age of 45 years (83.09%) and 138 of 142 by the age of 65 years old (97.18%). After this age, only 4 mentions of unrounded ages were recorded, so over the years the age of death is likely to be forgotten and rounded by the dedicators. Therefore, the dedicators had better memory concerning the ages of death belonging to those individuals who died during childhood and adolescence. The agglomeration of exact ages up to less than 35 years old could also be due to the higher life expectancy at birth for males than for females. The male sample includes a number of military and veterans, whose age of death is often indicated with precision (for example, 25 soldiers from a total of 72 and one veteran of 20 registered have ages ending in other digits, besides 0 and 5).

As regards the rounded ages for the male population in Noricum, the situation is found in Table 9.

Age category (years)	Number of rounded ages
5	6
10	15
15	14
20	48
25	39
30	52
35	19

40	31
45	10
50	44
55	10
60	49
65	5
70	36
75	7
80	11
85	1
90	5
95	1
100	8
105	0
110	1
115	0
120	1

Table 9. Classification of rounded ages by age categories

The age of death ending in digit 5, unlike the ones ending in digit 0, are recorded in a relatively low number (112 of 413 – meaning 27.11%). Like the female population, rounded ages are centred round large age categories. Most of the rounded ages are recorded for ages starting from 30 years old – 296 persons of 413, meaning 71.67%. We notice that most rounded ages are recorded at 30 years old (52 persons), 60 years old (49 persons), 20 years old (48 persons), 50 years old (44 persons), 25 years old (39 persons), 70 years old (36 persons), 40 years old (31 persons), 35 years old (19 persons), 10 years old (15 persons), 15 years old (14 persons), 45 and 55 years old (10 persons for each age) and 100 years old (8 persons). The age of 60 was considered the beginning of what we call today senescence. Though in the historiography related to the name given to the various stages in the life of the Roman citizens many authors claimed that *senex* began around 40, Parkin proved that the old age-related view was

far more complex and that, in the Roman world, the old age would have begun at 60[44] Without doubt, for the vast majority of old ages (70, 75, 80, 90 and 100 years old), the figures are rounded. For a population with high infant and young people mortality, it is rather difficult to believe that some individuals have reached their old ages.

Figure 3 presents the results of the analysis of the entire sample for Noricum by adding the persons whose gender could not be determined to the male and female population.

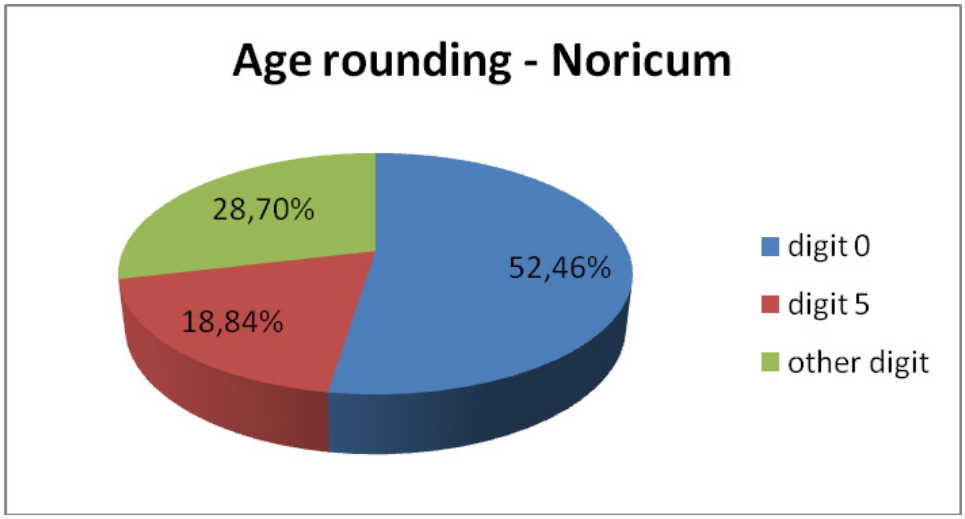

Figure 3. Age rounding for the population in Noricum.

The age rounding phenomenon at the level of the entire population follows the same patterns as in the case of male and females. The most numerous percentage are those ending in digit 0 – 52.46%, in the second place we find the unrounded ages – 28.70%, followed by the ages ending in digit 5 – 18.84%. In addition, by analysing the percentage of the precisely mentioned ages, meaning the 9 ages for females and the 4 for males, we obtain 13 very exact ages (in months and days). Their percentage at the level of the entire sample is 1.39%, an about average

[44] PARKIN 2003, 17–18, 21.

between the percentage of the females (2.56%) and that of the male population (0.72%).

In the subsequent lines, we will try to apply Whipple's Index to our sample and to compare it with the results obtained by Duncan-Jones. The results after applying Whipple's Index to the female sample are found in Table 10.

Age groups	Age ending in a number divisible by 5	Total	Whipple's Index
23–32	53	72	67.01
33–42	50	59	80.93
43–52	30	35	82.14
53–62	28	30	91.66
23–62	161	196	77.67
Mean of the four decades			80.43

Table 10. Whipple's Index for females

The number of persons within the age span 23–62 years is 196, meaning 55.84% of the overall sample. The first decade comprises almost 37% of the ages, and then they decrease down to the last decade. The lowest value of the index is registered at the decade 23–32. The relatively close values of the second and third decade, also close to the final mean of the index, show that the adult persons provide the general trend for the entire sample. The last decade registers the highest index value – 91.66, showing a strong rounding process; there is only two ages (53 years old and 62 years old) that are not divisible by 5.

The index value is very close to that obtained by Duncan-Jones for the female population in Noricum – 77.3[45]. This shows that there was a pronounced preference in this area for the age ending in a digit divisible by 5.

[45] DUNCAN-JONES 1977, 343, Table 8.

Walter Scheidel says, in his article concerning digit preference when expressing one's age, that the interval 23–62 or 20–69 is not the best choice in order to calculate preference digits, taking into account that, for the Egypt sample, Bagnall and Frier obtained a life expectancy at birth of 22.5 years[46]. Scheidel thought that Whipple's Index can afford to start with the data for age 10 without giving undue weight to the more accurate age records for juveniles because the cohort from 10–19 years is less fully represented then the cohorts from age 20 onwards. When evaluating census returns from Roman Egypt, in which the age from 60–69 years do not appear excessively imprecise, it seems reasonable to extend the overall age range to age 69[47]. Therefore, for his calculations, he used an extend sample with ages ranging between 10 and 69. We tried to apply the calculation method for Whipple's Index to this extended sample. In this case, our sample comprises 281 persons meaning 80.05%, with 85 persons more than the small one (Table 11).

Age groups	Age ending in a number divisible by 5	Total	Whipple's Index
10–19	9	38	4.60
20–29	46	66	62.12
30–39	56	74	69.59
40–49	34	36	93.05
50–59	33	37	86.48
60–69	28	30	91.66
10–69	206	281	66.63

Table 11. Whipple's Index for females (extended sample)

We have obtained a 66.63 value, much lower than that obtained for the sample 23–62. This is not surprising because, up to 25 years old, in our sample there were mainly unrounded ages, as we have shown above. The first decade provides a very low value, less than 20, which means that in

[46] BAGNALL, FRIER 1994, 77.
[47] SCHEIDEL 1996, 54–55.

this decade the rounding process is underrepresented. Starting with the fourth decade, the values increase: they are situated between 85 and 95. The fourth decade registers the highest index value – 93.05, showing a strong rounding process; there is only two ages (48 years old and 49 years old) that are not divisible by 5. The value of the rounding index at the level of the entire extended sample is significantly lower (by 11) than that of the reduced sample. The number of persons from each decade is increasing up to the 30–39 years decade, and then decreases by every decade.

From the legal perspective, as regards the female sample in Noricum, the situation is presented in Figure 4.

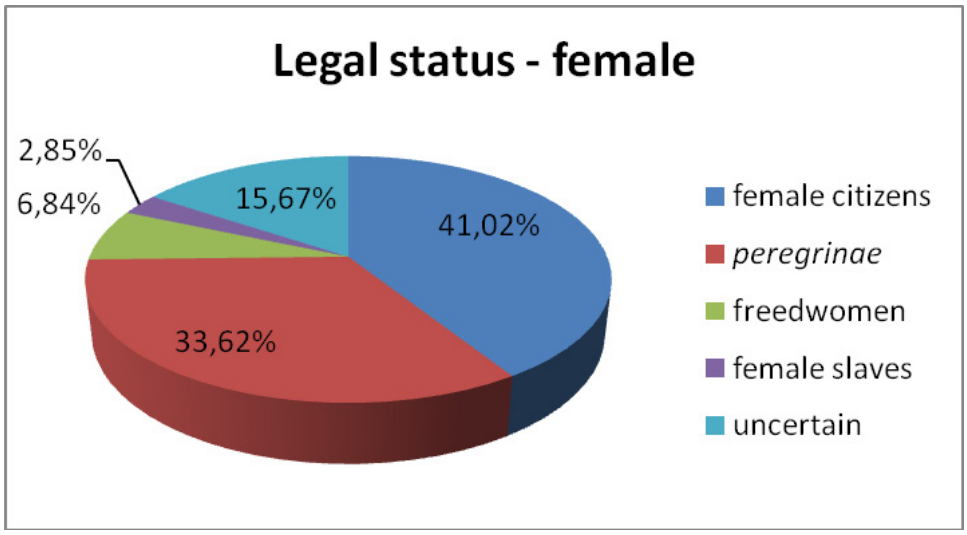

Figure 4. Legal status of the females in Noricum.

In order to identify any age rounding tendency determined by the legal status of the deceased females, we have applied Whipple's Index only for the female citizens and for the *peregrinae*, as the other categories (freedwomen, female slaves and uncertain) are too few to include them in the calculation (Table 12). The female citizens rounding process follows, broadly, a similar pattern with that of women in general. There are lower

values in the first two decades, while in the last two decades we record higher values (actually, they have the same value – 82.14).

Age groups	Age ending in a number divisible by 5	Total	Whipple's Index
23–32	24	36	58.33
33–42	18	25	65.00
43–52	12	14	82.14
53–62	6	7	82.14
23–62	60	82	66.46
Mean of the four decades			71.90

Table 12. Whipple's Index for female citizens

The index values of the mean of the four decades and for 23–62 age intervals are much lower than in the case of the entire female sample, which shows a smaller rounding tendency at female citizens than of women in general.

Age groups	Age ending in a number divisible by 5	Total	Whipple's Index
10–19	3	14	1.78
20–29	21	34	52.20
30–39	23	36	54.86
40–49	11	13	80.76
50–59	15	15	100
60–69	5	6	79.16
10–69	78	118	57.62

Table 13. Whipple's Index for the female citizens (extended sample)

In the extended sample (118 – meaning 33.61% of the entire female sample), an increase of the index values was found, which shows the accentuation of the rounding process by age (Table 13). In the first decade, the index value is very low – 1.78, which means that in this decade the

rounding process is underrepresented; while the fifth decade features only rounded ages. Starting with the age of 30, the rounding process is accentuated in the entire sample of citizens in Noricum. The value of the extended sample is significantly lower than in the case of the reduced sample.

Age groups	Age ending in a number divisible by 5	Total	Whipple's Index
23–32	20	22	88.63
33–42	18	19	93.42
43–52	13	14	91.07
53–62	13	14	91.07
23–62	64	69	90.94
Mean of the four decades			91.04

Table 14. Whipple's Index for the *peregrinae*

The situation of the *peregrinae* is very different from that of the female citizens in Noricum (Table 14). The *peregrinae* offer the image of a sample with an accentuated rounding process: only 5 persons of the 69 within the sample do not have rounded ages (7.24%). The first two decades presents the extreme limits of the index values: the lowest value in the first decade – 88.63, and the highest value in the second decade – 93.42. The index values of the mean of the four decades and for 23–62 age intervals are higher than in the case of the entire female sample, and much higher than that of the female citizens, which shows a smaller rounding tendency at women in general and female citizens than of the *peregrinae*.

Age groups	Age ending in a number divisible by 5	Total	Whipple's Index
10–19	4	17	4.41
20–29	16	20	75.00
30–39	21	22	94.31
40–49	14	14	100

50–59	12	14	82.14
60–69	14	14	100
10–69	81	101	75.24

Table 15. Whipple's Index for the *peregrinae* (extended sample).

In the extended sample of the *peregrinae* (101 persons – 28.77%) (Table 15), we notice a very low value in the first decade (the rounded ages are underrepresented), but also exclusively rounded ages in two other decades (40–49 and 60–69). The index value at the level of the extended sample is lower than in the above-presented situation.

In the case of persons with uncertain legal status, we notice 45 (of 55) rounded ages, in the case of freedwomen 18 (of 24) rounded ages, and in the case of female slaves 7 (of 10) rounded ages. We may pinpoint that, the higher the social status, the lower the age rounding process: the citizens were more careful and more aware concerning the persons' age than the other categories. Though rising proportionally with them, the age rounding process remains differentiated on social categories. The female citizens have lower scores than the *peregrinae*, except for the decade 50–59 of the extended sample. This can be explained by the fact that the sample of *peregrinae* also includes persons who had a good financial situation and a high education level, though they were not citizens.

The results of Whipple's Index applied on the male population in Noricum are found in Table 16.

Age groups	Age ending in a number divisible by 5	Total	Whipple's Index
23–32	91	108	80.32
33–42	50	56	86.60
43–52	54	65	78.84
53–62	59	69	81.88
23–62	254	298	81.54
Mean of the four decades			81.91

Table 16. Whipple's Index for males

The sample used to calculate Whipple's Index for males comprises 298 individuals, representing 53.69% of the overall male sample, which means a lower percentage than that of the female population. Nevertheless, this is understandable because in the female sample there are fewer individuals over 80 years old, while the male sample comprises eight centenarians and two individuals aged 110 and 120 years old. In the first decade we find the highest number of individuals with ages divisible by 5; the other three decades register lower values, but placed in an increasing order. The index values for the decades 43–52 and 53–62 are lower than the values obtain for females. The highest value of the Whipple's Index for males is 86.60 (in the second decade), showing a strong rounding process, there are six ages (two ages of 33 and ages 34, 37, 38 41 years old) that are not divisible by 5. The decades 23–32, 53–62, the 23–62 spans register close values to the mean, but slightly lower.

If we make a parallel with the results obtained by R.P. Duncan-Jones for Noricum, we notice that our value is slightly lower, but very close (Table 17). Duncan-Jones obtained 82.1 for the males of Noricum, compared to 81.54 – the index value that we attained for the ages in Noricum. In the roman evidence appears an age-deviation, which is usually greater for females. Noricum is one exception: the female's excess over males achieved by Duncan-Jones is -5.8[48], in our case the excess value is lower (-3.87). The underlying reason for these exceptions is likely to be sampling variations, and social discrepancies between samples for males and females.

Region	Male rounding	Female rounding	Female excess over male (percentage)
Italy outside Rome	42.6	41.8	- 1.9
Gallia	44.1	43.1	- 2.3
Rome	47.0	50.2	+ 6.8

[48] DUNCAN-JONES 1990, 86, Table 27.

Africa and Numidia	51.4	52.2	+ 1.6
Mauretania	51.6	54.1	+ 4.8
Dalmatia	53.3	56.0	+ 5.1
Hispania	56.6	58.4	+ 3.2
Moesia	57.2	73.3	+ 28.1
Germania	57.3	20.7	- 63.9
Dacia	61.2	65.0	+ 6.2
Pannonia	64.8	75.9	+ 17.1
Noricum	82.1	77.3	- 5.8

Table 17. Sex-differences in age rounding by region

Age groups	Age ending in a number divisible by 5	Total	Whipple's Index
10–19	29	63	32.53
20–29	87	111	72.97
30–39	71	79	87.34
40–49	41	49	79.59
50–59	54	64	80.46
60–69	54	59	89.40
10–69	336	425	73.82

Table 18. Whipple's Index for males (extended sample)

We tried to apply the calculation method for Whipple's Index to the extended sample (Table 18). In this case, our sample comprises 425 persons meaning 76.57%, with 127 persons more than the small one. The number of individuals from each decade increases and then decreases, but not in a constant manner. The lower index value is recorded in the first decade, while the highest value is found in the last decade (only 5 ages not divisible by 5). At the level of the entire sample, the index value is lower for the extended sample compared to the small sample.

As concerns the males of Noricum, besides the legal statuses of *cives*, *peregrinus*, freedman, and slave, we have added three others: magistrates, soldiers, and veterans (Figure 5).

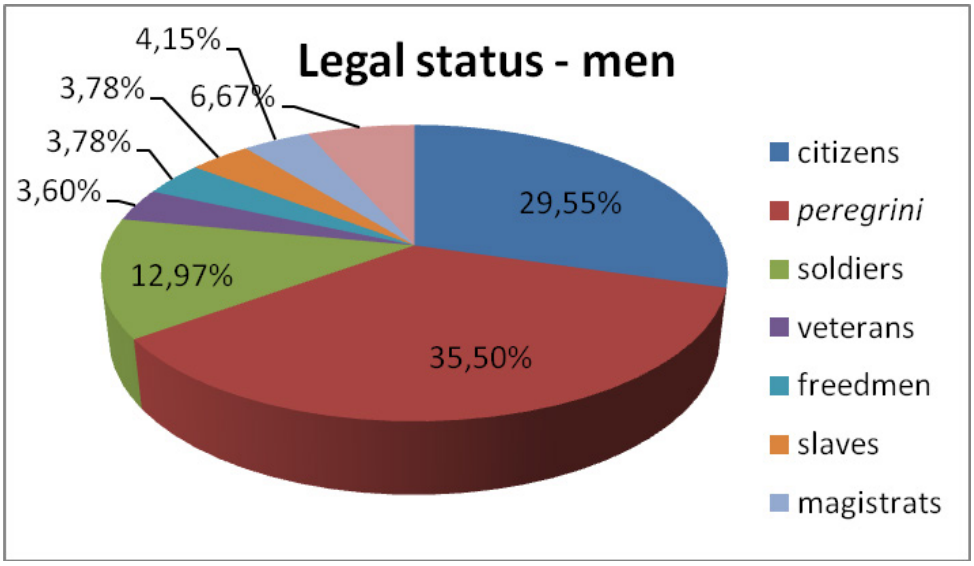

Figure 5. Legal status of the male population.

The magistrates would represent the wealthiest and most educated among the citizens and the *peregrine*, while the soldiers and veterans are categories that do not come only from the province and that present high mobility. We notice that the *peregrini* would represent the highest percentage in our sample, followed by citizens and soldiers and veterans. This is why we will analyse the three categories below, by observing and analysing the differences and similarities between them.

Age groups	Age ending in a number divisible by 5	Total	Whipple's Index
23–32	24	30	75.00
33–42	10	12	79.16
43–52	10	12	79.16
53–62	19	23	78.26
23–62	63	77	77.27
Mean of the four decades			77.89

Table 19. Whipple's Index for citizens

Age groups	Age ending in a number divisible by 5	Total	Whipple's Index
10–19	12	25	35.00
20–29	20	26	71.15
30–39	19	22	82.95
40–49	7	8	84.37
50–59	13	15	83.33
60–69	16	20	75.00
10–69	87	116	68.75

Table 20. Whipple's Index for citizens (extended sample)

The small sample comprises 77 individuals, meaning 13.87% (Table 19). For this sample, the model is similar to that of the entire male population. The decades 33–42, 43–52 (the same value) and 53–62 present higher values compared to the other decades and with the overall age span. All the values are lower than the values obtained for the entire population, with one exception: decade 43–52 records a higher value in the care of citizens. The values of the second, the third, and the fourth decade are slightly higher than the mean. After the age of 30, the age rounding process becomes significant. The extended sample is composed of 116 persons (20.90%), with 39 more than the small one (Table 20). In this case, the second decade has the lowest value of all, while the five other decades have double values compared to the first decade. The index value at the level of the entire extended sample (68.75) is significantly lower than in the case of the reduced sample (77.27); the difference is around 8.5.

Compared to the female citizens, male citizens register lower values for the third and fourth decade. It appears that, in the case of 43–62 age spans, when the deceased was a male citizen, the dedicators stated more exactly the age than in the case of a female citizen.

Age groups	Age ending in a number divisible by 5	Total	Whipple's Index
23–32	34	36	93.05
33–42	16	17	92.64
43–52	22	25	85.00
53–62	24	24	100
23–62	96	102	92.64
Mean of the four decades			92.67

Table 21. Whipple's Index for *peregrini*

Age groups	Age ending in a number divisible by 5	Total	Whipple's Index
10–19	10	21	34.52
20–29	30	32	92.18
30–39	25	26	95.19
40–49	14	15	91.66
50–59	23	26	85.57
60–69	20	20	100
10–69	122	140	83.92

Table 22. Whipple's Index for *peregrini* (extended sample)

The first decade within the first sample (102 individuals) offers a high value, followed by two decades with lower values, and the last decade is represented exclusively by rounded ages. In the extended sample (140 individuals, with 38 more), the first decade has the lowest value, while the last decade has the highest value of all. The other decades present high values, over 85. The age rounding process increases with the age in the case of *peregrini* in Noricum. It seems that, around the age of 60, the age rounded process is more pronounced.

The index values are different from those of the male citizens (Tables 21 and 22). We obtained very high values for *peregrini*, both for the reduced and for extended samples (more then 85), with one exception: the decade 10–19 of the extended sample registers a smaller value than in the

case of citizens. The decades 53–62 (for the smaller sample) and 60–69 (for the extended sample) include exclusively digits ending in a number divisible by 5. The mean is still slightly higher than that of the male citizens (the difference is around 15).

Age groups	Age ending in a number divisible by 5	Total	Whipple's Index
23–32	20	28	64.28
33–42	15	18	79.16
43–52	12	17	63.23
53–62	5	9	44.44
23–62	52	72	65.27
Mean of the four decades			62.77

Table 23. Whipple's Index for soldiers and veterans

Age groups	Age ending in a number divisible by 5	Total	Whipple's Index
10–19	0	2	0
20–29	17	27	53.70
30–39	16	20	75.00
40–49	12	17	63.23
50–59	8	11	65.90
60–69	7	8	84.37
10–69	60	85	63.23

Table 24. Whipple's Index for soldiers and veterans (extended sample)

The numbers of individuals from both samples are shown in descending order (except for the first decade within the extended sample, where the number is lower compared to the other decades). In the reduced sample, the 33–42 decade provides the highest index value – 79.16 (only 3 unrounded ages). The decade 60–69 from the extended sample offers also the highest value – 84.37, showing a strong rounding process; there is only one age (61 years old) that is nor divisible by 5. In this sample, the first decade does not present an age rounding process. The index values from

the second sample are mainly lower, but close to the ones from the first sample; the difference at the level of the entire sample is low: almost 2 (Tables 23 and 24).

In the case of soldiers and veterans, the only category less/worst represented in the age span 23–62 years old (12.97%), than the other categories analysed. Also, Whipple's Index values are relatively low compared to the entire male population, the citizens, and the *peregrini*. The fact that the soldiers and veterans have the lowest values of them all shows that it was easier to memorize the age in the army, mostly given that the data related to the enrolment age and to the years of military service were important for the General Staff and for the administration of the Roman State[49].

If we compare the values obtained for the sample between 23–62 years old and those for the extensive sample between 10 and 69 years old, we get the following values: citizens 23–62 years old 77.27 and 10–69 years old 68.75, *peregrini* 23–62 years old 92.64 and 10–69 years old 83.92; for the soldiers and veterans 23–62 years old 65.27 and 10–69 years old 63.23. The smallest difference is that of soldiers, because the militaries were enrolled starting with ages ranging between 18 and 22. This means that there are few representatives for the decade 10–19 years old (2 ages, both unrounded), a decade in our sample that lowers significantly the index value. This occurs because, toward 35 years old, there is a dominance of the ages ending in other digits than 0 or 5.

Even thought our study is based on a rather small sample compared to that included to the studies of Duncan-Jones and Scheidel, we notice, at the level of Noricum, certain tendencies as regards the preference for rounding ages (ending in a number divisible by 5).

Compared to the other Danubian provinces for which calculations have been made, the female population registers a higher preference for ages ending in the digit 0, having a lower but very close value to that of Moesia Superior, and at the same time higher than Pannonia Superior. The male population registers, for ages ending in the digit 0, the highest value

[49] PIFTOR 2013, 111.

of all the Danubian provinces. The unrounded ages appear mostly at small and young ages — under 25 for females, and under 35 for males. The rounded ages are concentrated, for both males and females, from 30 to about 80.

Because we have applied Whipple's Index of small samples, it was a little more difficult to set up tendencies, mostly that, when we having as criteria the legal status. We obtained a higher index value for females, and a lower, but very close index value for males compared to the ones calculated by Duncan-Jones. This may be due to the geographic location of the province. In Duncan-Jones opinion, the rounding appears most extreme in the northern frontier provinces, Noricum, Pannonia, Dacia, Moesia, and Germania. These provinces, which were certainly among the most backward parts of the Empire in terms of Romanization, may well have had generally low levels of education[50].

Higher age rounding by women is found in 7 of the 10 provinces (Moesia, Pannonia, Dacia, Rome, Dalmatia, and Mauretania, Hispania) or groups of provinces that were analysed by Duncan-Jones. In the other three areas, Gallia, Germania, and Noricum, the opposite pattern appears (situation confirmed by our calculation). The female citizens show a clear lower tendency for age rounding, compared to the *peregrinae*. As regards the male population, the soldiers and veterans represent the category with the lowest tendency toward rounded digits, followed by male citizens and *peregrini*.

The survey shows that age-awareness in the Roman Empire in general and in Noricum in particular was seriously defective. Modern parallels suggest that defective age-awareness is often accompanied by a low level of literacy, and that the two deficiencies can express similar forms of ignorance. The application of Whipple's Index on the epigraphic evidence from Noricum shows that there were large social variants in age-awareness; we noticed important differences by gender and class. The use of Whipple's Index in the future surveys of other Latin-speaking provinces of the Roman Empire will provide us with a better picture of the

[50] DUNCAN-JONES 1977, 344.

age rounding tendencies at the level of each province; it will also underline especially the differences regarding age-awareness by gender, class, and by geographical region.

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