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| Tutorial 9(Week starting on 16-may-2022) |

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| **Objectives**   * Study the concept of human capital   **Working materials**   * **A’Hearn B., J. Baten, and D. Crayen. [2009]** “Quantifying Quantitative Literacy: Age Heaping and the History of Human Capital” *The Journal of Economic History.* 69-3, 783-808 * **Excel** * You will need the **database** “Datos ejercitación 9” which can be found on the virtual campus[[1]](#footnote-1). |

**Exercise guide**

The exercises marked with an asterisk (\*) are compulsory and must be submitted by email **before 12.00 on Wednesday 25th May**. [[2]](#footnote-2) To the mark obtained on the evaluation of this assignment, **0.05 points will be subtracted for each minute late**. Consult the course program with regards to the formalities of the presentation.

1. (\*) Explain in a few words which question A'Hearn et. al. [2009] are trying to answer. What are the main results?
2. Explain in your own words what the following concepts named by A'Hearn et. al. [2009] mean and how they are related:
   1. Age heaping
   2. Numeracy
   3. Human capital
   4. Whipple Index
3. What does Figure 3 of the paper shows? What is the reason for the authors to include this figure? What are they trying to demonstrate?
4. Figure 4 in the paper shows the numeracy values over time. The authors separate Northern and Western European countries from Central and Eastern European countries. What is the main conclusion we draw from this figure?
5. (\*) Using the file "Data Exercise 9" answer the following questions:
   1. Create a variable that takes value 1 if the individual is male and 0 if the individual is female for the 1895 census. Note that the variable "Female" takes value 1 if the individual is female and 0 if the individual is male.
   2. Calculate the traditional Whipple Index and the modified Whipple Index according to the authors for the entire population, for females and for males for both censuses.
   3. How is the modified Whipple Index interpreted in the 1895 census?
   4. Calculate the percentage of the population literate in 1895 according to the "Literacy" variable. How does it compare with the modified Whipple Index for the entire population?

1. The authors want to study the development of human capital using numeracy as a proxy. To get that estimate, they exploit census data where people self-reported their ages, given the existence of a tendency among “i-numerate” people (those who can’t count and don’t know numbers well), to guess a multiples of five, “round numbers”, as their ages. With this data, they measure a Whipple index that calculates the deviation from a perfect distribution of last digits and convert it into a numeracy rate. They demonstrate a high positive corelation between numeracy and literacy to defend the use of the measure for the thesis and account for trends in changes in numeracy across time.

2.

a. Age-heaping is the practice of “rounding” one’s age when one is not sure what that is, and it is what the authors attribute to not knowing the numbers.

n. Numeracy is, like literacy is for reading and writing, the proportion of people who can count and understand numbers properly.

c. Human capital is a concept of the capacity of people to do varied activities and works, so improvements in human capital would be more educated general populations, for example.

d. The Whipple index is a measure from 0 to 500 that tells the ratio of the quantity of numbers ended in 5 or 0 in a set to the expected perfect distribution among the total amount of factors in the set.

3.

Figure 3 shows the progress of numeracy and literacy in different cities. The reason is to show that although the two are highly correlated, they not always are linearly corelated through time. They try to demonstrate that numeracy can improve greatly without there being much change in literacy levels. Such is the case with Hungary or northern Italy, and it would show basic numeracy doesn’t require schooling: general literacy is much harder to achieve that being able to tell one’s age. Also, that improvements in numeracy could be a good measurement of increased trade, as north Italy experienced. Also, improved literacy but not much improvement in numeracy can e due to the practice of misreporting being locked in on certain groups.

4. The main conclusion that can be drawn from comparing East-West numeracy rates I that disparities were grater in the seventeenth century and that de divergence began during the Middle Ages after which they tend to converge, and the east rises very dramatically in spite of the “second serfdom”

5.

c. the Whipple index returns a number that’s quite close to a 100, meaning the deviation from a perfect distribution of fives and zeroes wasn’t too extreme as it would be close to 500.

d. The numeracy rate appears greater than literacy, perhaps indicating age-heaping wasn’t very common in 1895.

1. The databases were created from the databases available at Manzel K., J. Baten & Y. Stolz. [2012] “Convergence and divergence of numeracy: the development of age heaping in Latin America from the seventeenth to the twentieth century” *Economic History Review*. 65-3, 932–960 [↑](#footnote-ref-1)
2. Check the course’s syllabus on presentation [↑](#footnote-ref-2)