

OPERATIONS WITH FRACTIONS IN SPANISH 16TH CENTURY ARITHMETIC TEXTS

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According to Bishop (1991, p. 34) measuring is one of the “universal and significant activities for the development of mathematical ideas”. In fact measurement processes play a central role in the historical genesis of rational numbers either by direct measurement or by the comparison of quantities of magnitudes (Escolano & Gairín, 2005). As a consequence, and even if the use and treatment of fractions differed among cultures (Chemla, 1994), it is not surprising that this topic is already found in the oldest preserved mathematical texts. As expected, one of the fundamental aspects that was consistently covered by the authors throughout the history was related to the performance of the four basic operations (addition, subtraction, multiplication and division) with fractions. In the context of medieval Arab texts, Djebbar (1992, p. 229) points out that “les entiers, les fractions, les sommes d’entiers et fractions et les sommes de fractions sont des entités distinctes, les auteurs consacrent ainsi a la multiplication et a la division autant de sections qu’il y a de combinaisons, deux à deux, de ces entités”. This was also the case in many Spanish texts during the 16th, and even the 17th century. In fact, many different approaches and presentations can be identified among texts (Oller-Marcén, 2021). In this work, we consider the treatment of the four basic operations with fractions in arithmetic books published in Spain around the 16th century (Rey Pastor, 1926; Salavert Fabiani, 1990; Madrid, 2016). In particular we will describe the very different treatments according to variables such as the considered entities, the number of addressed cases, and their sequencing. This might lead to the discussion about the underlying motivations of the authors for their choices, and also about the possible sources and influences.

Keywords: Fractions, Arithmetic, Operations, Spain, 16th century.

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