Complexity in counting systems: early systems vs. modern numerical ones

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Numerical numerals are at the cross-roads of linguistics, mathematics, cognitive sciences, archaeology, and anthropology. Yet counting or quantification is not necessarily numerical nor is it necessarily language-bound. Infants, for example, recognize (change in) quantity and speakers of languages with few numerals easily identify large quantities.

A strong trend today is the spreading of a counting system that is numerical, decimal, and based on arithmetical operations, especially addition and multiplication. Numerical counting systems with high upper limits—such as decimal systems—are easily qualified in the literature as "complex". Yet the criteria to identify "complexity" often remain implicit or may be open for discussion.

While the decimal numerical system continues to spread globally, it reduces numeral variation even if many languages in the past and today feature residues of earlier counting or measure systems. The Latin measures of length, for example, were based on body parts, with La. *pes* 'foot' equaling sixteen *digiti* ('fingers') or four *palmi* ('palms'), and the *gradus* 'step' equaling 2.5 *pedes*, and five *pedes* equaling one *passus* 'pace'. Similarly in today's Indo-European languages, residues of earlier quantification systems relate quantity to commodity, each with their own (base) units for example, cf. Engl. *stone* (weight), *pint* (volume, liquid), or UK's pre-1971 monetary *pound* system; Fr. *pouce* (length), *muid* (volume, dry/liquid), and so forth.

These residues allow to identify the main features of earlier systems, which ultimately may have their origins in non-numerical systems, such as the one based on tokens in the early stages of the agricultural revolution in the Near East.

In this talk, I discuss the spread of the decimal system identifying its various manifestations and evaluating its main characteristics against early systems of quantification as we know them from residues of the type mentioned above. This comparison will provide data and insights to assess the concept of "complexity" in counting systems.