TITLE

Euclid's Implicit Theory of Definition:
Linguistic Regularities of Euclid's Definitions in the *Elements*

ABSTRACT

My paper argues that Euclid's philosophical commitments pertaining to scientific definition can be reconstructed from linguistic regularities of Euclid's definitions in the *Elements*. While Euclid nowhere talks about his mathematical works, Euclid's treatise nonetheless contains sufficient evidence for his implicit philosophical commitments and meta-mathematical background assumptions. By observing linguistic regularities in Euclid's *Elements*, Euclid's philosophical presuppositions can be extracted. I have created a vast linguistic database, which classifies the 167 (putative) definitions stated in the *Elements* according to various grammatical and logical criteria. So far, I apply nearly 50 criteria, which provide descriptive statistics of the linguistic features of Euclid's definitions. On the basis of this database, I unveil aspects of Euclid's logic, Euclid's theory of science, and Euclid's metaphysics. To give only two examples, I argue that Euclid is committed to the following:

- a sharp distinction between species and differentiae; and
- priority in definition (*A* is prior in definition to *B* just in case *A* can be defined without *B*, whereas *B* cannot be defined without *A*).

For instance, Euclid rigidly defines the differentiae of mathematical species (such as *straight* for lines, and *even* and *odd* for numbers) in a way that is syntactically different from the way in which he defines the mathematical species (such as the line and the number) themselves. Therefore, we can infer that he systematically distinguishes between species and differentiae. Moreover, since Euclid always introduces fundamental items before derivative ones and simpler terms before more complex ones, we can attribute the notion of *priority in definition* to Euclid. The above-mentioned philosophical commitments are shared by pre-Euclidean philosophers such as Plato and Aristotle. Euclid also however appears to be committed to more recalcitrant views, such as multiple definition, which are not shared by either Plato or Aristotle.