Leibniz's 'universal characteristic': context, paths and implications

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PhD Dissertation

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In the course his life, Leibniz sought to create a universal language able to communicate thought in a perfect manner and thus allowing for the knowledge of everything. According to him, the feasibility of such construction depended on the fact that the entire scope of knowledge is based on a finite number of basic concepts or simple ideas, which could be identified and hierarchically structured. He believed that the elaboration of such language required: defining the simple ideas; setting a proper system of signs - which he called *universal characteristics*; and establishing the logical rules needed to compose complex ideas – which he designated as *rational grammar*.

Therefore, the aim of the present study was to investigate the universal language, more particularly the *universal characteristic,* as well as the paths followed by Leibniz in that quest. As specific objectives, I sought to verify how Leibniz developed his research on binary arithmetic, which represents the materialization of the universal characteristic, and to describe briefly his rational grammar. As research support, I included some discussions on the foundation of a universal language that took place in the 17th and early decades of the 18th century, as well as their relevance for the development of science.

I conclude that while Leibniz kept his intention to create a definitive and complete symbol system until the end of life, eventually he admitted that the magnitude of that project was excessive, as well as the many difficulties he had met. His efforts, nonetheless, contributed to the development of science, mathematics in particular, through the creation of infinitesimal calculus and the improvement of binary arithmetic. In the elaboration of the text, I sought to articulate three spheres of analysis, namely historiographical, epistemological and historical-contextual.

Keywords
History of mathematics; Leibniz; Rational grammar; Binary arithmetic, Jungius; Universal language