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Investigation into Approximate Number System: Cognitive Underpinnings and Relationship with Arithmetic Fluency

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Abstract

The approximate number system, involved in the estimation of large numerosities, forms the basis for the development of mathematics ability. Although researchers have investigated the cognitive underpinnings of the approximate number system, the specific underlying cognitive abilities involved need better theorisation. There have also been conflicting findings regarding the relationship between the approximate number system and mathematics ability. Therefore, the current study had twofold objectives: 1) To investigate the cognitive underpinning of the approximate number system. 2) To test whether the approximate number system can predict mathematics ability. A total of 31 primary school children participated in the study. To measure approximate number system and mathematics ability, non-symbolic number comparison and arithmetic fluency tasks were used, respectively. Using repeated measure ANCOVA and multilinear regressions, results revealed that only inhibitory control played a significant role in the approximate number system. Furthermore, the approximate number system could not predict arithmetic fluency.