

Mathematics and Reading Integration: Overlapping Skills Development among Kindergarteners

Mathematics and reading are two core subjects in school learning. Both are strong predictors of one's achievement in later life. Prior to formal instruction in elementary school, children have already started to acquire some skills in mathematics and reading in kindergarten which lay the foundation for learning in later years. Hence, it is important to provide quality support for early development in both mathematics and reading. Although each subject has its own specific skills that children need to develop during early years (e.g., verbal counting for mathematics and phonological awareness for reading), previous studies have shown that the two subjects are interrelated. Some core skills specific to one domain are related to the achievement in the opposite domain (e.g., verbal counting is associated with reading achievement whereas phonological awareness is associated with mathematical achievement). However, we still do not have a full picture of this cross-domain relation. Hence, this project aims to discover how fundamental skills in one domain are associated with the development in the other domain, i.e., mathematics versus reading, during the kindergarten years. Its findings will offer important implications for screening and support for early difficulties in mathematics and reading. To trace children's development in mathematics and reading, this project is a longitudinal study with four phases across the second and third years of early childhood education in Hong Kong. While most of the previous studies addressing the interrelation between mathematics and reading have focused on inter-individual differences (e.g., why some children have better or worse performance than others), this project takes a different approach by focusing on intra-individual growth (e.g., what predicts the rate of change over time for individual children). Our approach is better aligned with the goal of education, which highlights the importance of supporting individual children to realize their potential. Hence, intra-individual growth is the key. This project aims to discover the "cross-domain" skills which are associated with the growth trajectory of mathematical and reading performance. In particular, it asks whether the initial achievement in one domain predicts the growth of achievement in the other domain. Furthermore, it asks which specific skills in one domain predict the growth of abilities in the other domain, and whether family SES has a role to play in the predictive relations. By addressing these questions, this project will offer a fuller picture of the reciprocal relation between mathematics and reading.