Advanced constructional play with LEGOs among preschoolers as a predictor of later school achievement in mathematics

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Abstract:
The research question asked was "Will those children ages three and four who have intensive play experiences in play-based preschools and who can perform at high levels of LEGO building as constructional play also show high levels of mathematical achievement later in formal school settings?". Thus, this study attempts to establish a correlation between the levels of LEGO play performance of young children and their later school (elementary, middle, and high school) achievement in mathematics. The predictor variables of levels of LEGO play, while controlling for IQ, and gender, were measured in Fall 1982 by testing a group of 3-year-old and 4-year-old preschoolers (n = 47), and later, longitudinal effects were examined after these same participants had completed high school (n = 37). The dependent or outcome variables obtained from the participants' school cumulative records included: (1) results from the California Achievement Test, (2) the grades in mathematics courses, and (3) higher mathematics courses taken in high school.
LEGO performance during the preschool years and the later variables of students' letter grades, and mathematical achievement on standardized tests did not demonstrate significance at the third and fifth grade levels. At the same time no significance was found at seventh grade levels on teacher-awarded grades, but a clear significance was found for standardized testing at the seventh grade level. Also, since all other outcome variables at the middle school and high school levels such as number of mathematics classes taken, number of honors mathematics classes taken, average mathematics grades, and a combined weighted value of all mathematics courses taken were all significant, we may clearly state that there is a statistical relationship between early LEGO performance among preschool and achievement in mathematics, not seen during the elementary school years, but later developing at the middle and high school level.

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