

open-minded in working styles, and emotionally stable, creative scientists differ from creative mathematicians in being more self-assertive, dominant, striving, and hard working, but somewhat less oriented toward humanitarian concerns and toward a need for order. To explain the nature of intellectual functions involved in the creative process and in the steps required in creative problem solving, Guilford's structure-of-intellect (SOI) model and his information-processing structure-of-intellect problem-solving (SIPS) model were described. The constructs of these two models were related to Rossman's seven-step paradigm for invention, which also provides a useful description of the sequence of steps for creative production and problem solving. Implications of the two Guilford models for teaching for creative endeavor in mathematics and the physical sciences were described and illustrated.

## **RATIONALE OF SMPY DURING ITS FIRST SEVEN YEARS OF PROMOTING EDUCATIONAL ACCELERATION**

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The Study of Mathematically Precocious Youth (SMPY) began officially at The Johns Hopkins University in September of 1971 under a five-year grant from the Spencer Foundation. Its staff, headed by Professor (of psychology) Julian C. Stanley, seeks highly effective ways to facilitate the education of youths who reason extremely well mathematically. In order to do so, it is of course necessary first to identify such youths and understand them well. During SMPY's first seven years much service was rendered to the mathematically talented in the State of Maryland, especially seventh and eighth graders in the Greater Baltimore area. This enabled the SMPY staff to develop and refine principles, techniques, and practices with which to improve the education of intellectually talented students. SMPY's underlying rationale is not fully obvious from the two books thus far that report its substantive achievements. Thus it seems desirable to state that rationale clearly so that its assumptions can be examined by all persons who consider using SMPY's practices. This chapter is the initial attempt to set forth explicitly the point of view guiding SMPY's activities. [The Spencer Foundation has renewed its support through year 8, and several other grants have also been received by SMPY.]