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The longitudinal development of understanding of average.

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The development of the understanding of average was explored through interviews with 94 students from Grades 3 to 9, follow-up interviews with 22 of these students after 3 years, and follow-up interviews with 21 others after 4 years. Six levels of response were observed based on a hierarchical model of cognitive functioning. The first four levels described the development of the concept of average from colloquial ideas into procedural or conceptual descriptions to derive a central measure of a data set. The highest two levels represented transferring this understanding to one or more applications in problem-solving tasks to reverse the averaging process and to evaluate a weighted mean. Usage of ideas associated with the three standard measures of central tendency and with representation are documented, as are strategies for problem solving. Implications for mathematics educators are discussed.

Classification: K40

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