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Generating scenarios of addition and subtraction: a study of Japanese university students.

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Summary: Students are presented with problems involving three scenario types of addition and subtraction in elementary mathematics: one dynamic ("change") and two static ("combine, compare"). Previous studies have indicated that the dynamic type is easier for school children, whereas the static types are more difficult and comprehended only gradually throughout elementary grades. However, these differences in scenario difficulty have not be adequately investigated in adults to ascertain whether they persist in adults who have used the operations for a long period of time. This study examined this with Japanese university students (ages 18–23 years). In Study 1, 99 participants were provided with one numerical equation and one picture representing one of the three scenario types, and were instructed to generate a single scenario. In Study 2, 97 participants were provided with one numerical equation and were instructed to recall the various scenario types that they had encountered previously and to generate multiple scenarios of diverse types. Results indicated that participants found the dynamic scenario types easier than static ones, and they tended to understand the given information of static types by interpreting them in dynamic forms (Study 1). In addition, they strongly preferred generating scenarios of dynamic type over static types (Study 2). Implications for mathematics learning are discussed.

Classification: F30 D30 D40
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