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Relationships between students' fractional knowledge and equation writing.

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Summary: To understand relationships between students' fractional knowledge and algebraic reasoning in the domain of equation writing, an interview study was conducted with 12 secondary school students, 6 students operating with each of 2 different multiplicative concepts. These concepts are based on how students coordinate composite units. Students participated in two 45-minute interviews and completed a written fractions assessment. Students operating with the second multiplicative concept had not constructed fractional numbers, but students operating with the third multiplicative concept had; students operating with the second multiplicative concept represented multiplicatively related unknowns in qualitatively different ways than students operating with the third multiplicative concept. A facilitative link is proposed between the construction of fractional numbers and how students represent multiplicatively related unknowns.

Classification: H33 F43 E53
Keywords: equations; skills; mathematical concepts; fractional knowledge; algebraic reasoning; equation writing; multiplicative concepts; iterative fraction scheme; middle-school students; quantitative reasoning; unknowns
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