Effect of denominator in the fraction on number line estimation: an exploration of the list of the basic fraction in Japanese university students

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Abstract

Familiar fractions (e.g., 1/2, 2/3, and 3/4) play a key role in fraction representations. Recent studies showed that, even in mathematically matured adults, fraction processing was facilitated for familiar fractions (Liu, 2017; Taniguchi, et al., 2017). The working hypothesis was that fractions with small denominators are represented through retrieval and underpin the representation of larger denominator fractions (Liu, 2017). However, the list of the distinctive basic denominators has not been systematically investigated. Thirty university students performed number line estimation of fractions with 2-19 in the denominators. The results showed that the fraction 1/2 showed shorter RT and error distance than fractions with other denominators. Additionally, fractions with three in the denominator showed shorter RT than other fractions, but were equivalent in accuracy. This suggests that fractions with two and three in the denominator are distinctive, and those with larger denominators would need additional processes at least for number line estimation.