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Measuring fraction comparison strategies with eye-tracking.

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Summary: Research suggests that people use a variety of strategies for comparing the numerical values of two fractions. They use holistic strategies that rely on the fraction magnitudes, componential strategies that rely on the fraction numerators or denominators, or a combination of both. We investigated how mathematically skilled adults adapt their strategies to the type of fraction pair. To extend previous research on simple fraction comparison, we used a highly controlled set of more complex fractions with two-digit components. In addition to response times, we recorded eye movements to assess how often the participants fixated on and alternated between specific fraction components. In line with previous studies, our data suggest that the participants preferred componential over holistic strategies for fraction pairs with common numerators or common denominators. Conversely, they preferred holistic over componential strategies for fraction pairs without common components. These results support the assumption that mathematically skilled adults adapt their strategies to the type of fraction pair even in complex fraction comparison. Our study also suggests that eye-tracking is a promising method for measuring strategy use in solving fraction problems.

Classification: F40 C80

Keywords: fraction processing; holistic strategies; componential strategies eye movements

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