Impact of Polarity, Rationality, and Math Ability on Numerical Magnitude Knowledge

Laura Young
Temple University , Philadelphia, PA , United States

Julie Booth
Temple University , Philadelphia, PA , United States

Kelly McGinn
Temple University , Philadelphia, PA , United States

Abstract: Previous research has shown that numerical magnitude knowledge is related to current mathematic abilities and predictive of future mathematics performance. Much of this early research examined magnitude knowledge of positive whole numbers, more recently this has been extended to positive rational numbers. However, research about negative number magnitude knowledge is less abundant. The present study aims to understand how different types of magnitude knowledge relate to one another and whether performance differs according to the type of number line scale. Thirteen number line scales were used to assess 7th grade students' (N=180) magnitude knowledge of positive and negative, whole and rational numbers. Correlational analyses illustrate that performance on most scales are significantly related. Further analyses reveal that students' performance differed depending on the scale's polarity and the number type of the scale. Moreover, performance differences were found to vary according to students' mathematics classroom ability level. Educational implications are discussed.