Time and Number: From the Lab to School

Alejandro Maiche

CIBPsi - Center for Basic Research in Psychology, Faculty of Psychology,
Universidad de la República, Uruguay.

The relationship between time, space and numbers is still a debated issue in the study of cognition. However, empirical data suggest that some interactions between processing number and time may exist. But, what is the relationship between our intuitive sense of numbers (e.g., when estimating how many marbles are in a jar) and our intuitive sense of other quantities, including time (e.g., when estimating how long it has been since we last ate breakfast)? Recent work in cognition suggests that our representations of approximate number, time and spatial extent are fundamentally linked and constitute a "generalized magnitude system". If this is the case, training in time perception could give some benefits in numerical tasks and from here we could get better performance in math.

In this experiment, we investigate the relationship between approximate number system and time under controlled conditions at the lab with 10 subjects using 2 different tasks. Then, in a larger sample of 6-8 year-old children in Uruguay, we measured time discrimination, numerosity discrimination and math performance. We found that math abilities correlate with approximate number precision and time perception discrimination. We also observed interesting differences in the data collected at the lab and those from School, suggesting that the relationship between quantity representations and formal math is not direct. Our data suggest a cognitive link between time perception and number, probably due to a shared neural representation but it is not enough to go easily from one dimension to the other. This line of research contributes to clarify how the notion of time is acquired and how it influences our cognition and behavior.