

Automatic processing of place-value in four-digit numbers depends on number  
complexity

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Coding of place-value of numbers is as relevant in number processing as coding the identity of the corresponding digits. Recently, Kallai & Tzelgov (2012), manipulating physical size and numerical magnitude in a physical size decision task, found longer response times when the numerical magnitude of four-digit numbers was not congruent with its physical size. They concluded that place-value of multi-digit numbers is processed automatically. However, these authors, with the aim of isolating the effect of place-value, used exclusively strings composed by three zeros and one non-zero digit that varied its position within the string (e.g., 0060 vs. 0600), hence it is uncertain whether automatic coding of place-value can be extended to more complex number strings (e.g., 1364 vs 1634). In the present research, together with Kallai & Tzelgov's stimuli, numbers composed of four different non-zero digits (e.g., 7192 vs. 7912) were employed. Fifty-nine participants were requested to decide which of the two four-digit length numbers was presented in bigger font. Results using Kallai & Tzelgov's stimuli replicated the findings of these authors. However, no evidence of place-value processing was found with the all-different stimuli. Automatic coding of place value seems to be affected by the complexity of numbers to be processed.