# The Effects of Growing Up Multilingual on Cognitive Thinking

Escaja-Heiss, Vera

The purpose of this experiment is to further understand the impacts that growing up multilingual has on an individual's way of thinking, problem-solving, and memory. To test this question 20 multilingual students and 20 monolingual students were given three different assessments to assess their cognitive thinking skills, consisting of an online memory game, a pattern recognition test, and 7 problem-solving riddles. Prior to data collection, it was hypothesized that individuals who grew up multilingual would have the best performance in all three of these categories, based on the commonly known process and neurological rewiring that individuals take on as children by absorbing not just one but two or three languages. The data analyzed proved this hypothesis accurate; in pattern recognition and especially memory, the multilingual students seemed to have much higher results. The average pattern recognition score of the multilingual participants (122.5) was found to be 2.24% higher than that of monolinguals (119.75), and the memory scores for multilingual participants were shown to be 25.44% higher (9804.8 v. 7310.05). In the contrary, the average amount of riddles that were answered correctly was found to be the same for both groups at 5.15/7 riddles. Further understanding of the impacts of growing up with more than one language may cause a change in the world's intellectual and academic demographic. The discovered benefits of growing up multilingual is also a push for the United States to get on the standard of teaching students a second language at a much younger age as other countries have been doing for decades. These results are furthermore a spark for young scientists to continue with this topic and research it further in depth.