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Shared environment in second language learning

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ABSTRACT:

Learning a second language has a decisive role on educational progress, autonomy, and self-development in the globalized world. Surprisingly, despite the interest of this phenotype, there is much to know about why individuals differ substantially in their second language performance. The objective of this work is to analyze the relative contribution of genetic and environmental factors to the acquisition of a second (foreign) language in our educational context. Results from the standard exam of second language for university access were analyzed in 98 pairs of twins (52 MZ; 46 DZ) participants in the Murcia Twin Registry (76.5% women). 94.3% were English exams and the rest French. Mean score was 6.1 (SD: 2.2). A univariate model was applied using structural equation models to estimate heritability. Correlation was higher for MZ twins ($r_{MZ} = .71$; 95% CI: .53, .83) than for DZ ($r_{DZ} = .59$; 95% CI: .34, .76). An ACE model where family factors have a substantial effect showed a good fit to the data ($A = .32$; 95% CI: .00, .79; $C = .41$; 95% CI: .00, .72; $E = .28$; 95% CI: .18, .44). AE and CE models did not differ significantly from the full ACE model but both of them with a similar fit ($p = .09$ and $p = .13$, respectively). Shared environmental factors explain a greater proportion of variance in this phenotype than genetic or unique environmental ones. The weight of the shared environment and, therefore, heritability may vary between countries depending on socio-cultural circumstances.

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