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TITLE:

Genetic influence on academic achievement and educational opportunities controlled by socioeconomic effect.

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ABSTRACT:

Numerous studies of educational sociology have been reporting that the parental socioeconomic status (SES) influences educational environment and academic achievement of children (eg. Broer, Bai & Froseca, 2019). Although SES contains not only shared environmental but also genetic components, behavioral genetic studies revealed that even after controlling genetic influence, shared environmental factors substantially affects SES (eg. Walker, Petrill & Plomin, 2005). The current study investigated how much genetic factors influenced academic achievement and educational opportunities of children after controlling SES using the twin method.

2359 pairs of twins (MZ=689, DZ=783 for elementary school and MZ=511, DZ=376 for secondary school) and their parents in Tokyo and its neighbor prefectures provided parental income and educational history, nurturing attitude, number of books, childrens' academic achievements and their learning environments (study time and extracurricula activities)

Parental SES significantly correlated with children's academic achievement and their learning environment ($r_{\max} = .30$). However there were still huge genetic variance for academic achievement especially in elementary school level (around 70%) even after controlling SES. Genetic variation for academic achievement decreased in secondary school level. On the contrary, children's learning environment were exclusively affected byu shared environment for both levels of schools.

References

- Broer, M., Bai, Y., & Fonseca, F. (2019) *Socioeconomic inequality and educational outcomes: Evidence from twenty years of TIMSS*. IEA.
- Walker, S.O., Petrill, S.A., & Plomin, R. (2005) A genetically sensitive investigation of the effects of the school environment and socio-economic status on academic achievement in seven-year olds. *Educational Psychology*, 25(1), 55-73.

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