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## Discordant–Sibling Designs and Applications for Differential Psychology

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### ABSTRACT:

Randomized experiments are the “gold standard” for inferring causation and are designed to collect covariate information (Rubin, 2008). Yet, many questions cannot be answered with experiments practically or ethically. Often, potential confounds are controlled statistically as covariates in quasi-experimental designs. The typical use of covariates does not control for many systematically confounded gene-and-environmental effects. Poverty, health, and personality all covary with gene-and-environmental effects, so much so that using covariates can create bias. We advocate for using genetically-informed designs as they support better causal inference without random assignment and adjust for most gene-and-environmental elements. We illustrate the discordant kinship model (Garrison & Rodgers, 2016). Differences between kin pairs explicitly distinguish within-family variance from between-family, and control for all background variance linked to gene-and-environmental differences. We present three illustrations with personality predictors, specifically conscientiousness and neuroticism interacting with socio-economic status from the NLSY79 dataset. All three illustrations found significant associations when using covariate-based approaches. After addressing systematic confounding within the discordant-kinship approach, the results diverged. Understanding the relationship between poverty, mental health, and personality as related to genetic or environmental effects can aid in the overall health of a person.

### References:

Garrison, S. M., & Rodgers, J. L. (2016). Casting doubt on the causal link between intelligence and age at first intercourse: A cross-generational sibling comparison design using the NLSY. *Intelligence*

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