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Distinguishing Well-being and Resilience: a GWAS-by-subtraction study in UK Biobank

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ABSTRACT:

Resilience can be defined as the ability to quickly recover after experiencing stress, returning to an optimal mental state. In a previous study, we reported a strong phenotypic relation ($r=.50$), a large overlap and possible bidirectional causality between resilience and well-being (de Vries et al. 2021). In a bivariate twin model, the genetic and environmental correlations between resilience and well-being were respectively .71 (95% CI: 0.70-0.71), and .93 (95% CI: 0.86-0.98), indicating a large overlap in the genetic and environmental factors underlying resilience and well-being. The strong phenotypic, genetic, and environmental correlations between well-being and resilience suggests a partly overlapping etiology, which sometimes leads to the claim that well-being *is* resilience and that the same trait is assessed but with a different name. In an ongoing project, we further investigate the relation, overlap and differences between resilience and well-being using molecular genetic analyses. First, we perform a GWAS on UK Biobank data to investigate the genetic variants related to resilience. Next, we apply the GWAS-by-subtraction method (Demange et al. 2021) using the UKB happiness GWAS of Baselmans and Bartels (2018) and our UKB resilience GWAS to directly investigate the overlap between happiness and resilience. Subtracting the resilience GWAS from the happiness will lead to a GWAS of “pure happiness”, by removing genetic variants associated with resilience. In follow-up analyses, we investigate and compare the genetic variants associated with resilience, happiness, and “pure happiness” using functional annotation, gene-mapping, and gene-based tests and we compute genetic correlations with a range of phenotypes.

References

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