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## Predicting Disordered Gambling Across Adolescence and Young Adulthood from Polygenic Contributions to Big 5 Personality Traits in a UK Birth Cohort

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### ABSTRACT:

Phenotypic associations between disordered gambling (DG) and the Big 5 personality traits have been demonstrated throughout the literature. However, only one twin study to date has examined these genetic associations. The aim of the present study is to examine the genetic associations between the Big 5 personality traits and disordered gambling using multiple polygenic risk score (PRS) approaches, (i.e., pruning and thresholding (P+T) and PRS-CS). Summary results from a genome-wide association study (GWAS) of the Big 5 personality traits were used as weights for the creation of the PRSs. PRSs were created in 4,729 unrelated children of European ancestry from the Avon Longitudinal Study of Parents and Children (ALSPAC) study. The resulting PRSs were used to predict past-year assessment of DG using the Problem Gambling Severity Index (PGSI) and lifetime assessment of DSM-IV pathological gambling symptoms (DPG) across the ages of 17, 20, and 24. PRSs for agreeableness negatively predicted PGSI scores ( $\beta$ s=-0.25 - -0.15;  $P$ s= 0.002- 0.009) and PRSs for neuroticism positively predicted PGSI scores ( $\beta$ s=0.11 - 0.15;  $P$ s= 0.000003- 0.001) using both PRS methods. PRSs for agreeableness also negatively predicted DPG using the P+T method ( $\beta$ =-0.20;  $P$ = 0.0004). Finally, the neuroticism PRS showed positive main effects when predicting DPG using PRS-CS ( $\beta$ =0.14;  $P$ = 0.009) and an interaction with age when using the P+T method ( $\beta$ s=0.18-0.29;  $P$ s= 0.002-0.009). Findings suggest polygenic contributions to low agreeableness and high neuroticism are significantly associated with lifetime and past year measures of DG and these associations are relatively consistent across different PRS approaches.

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