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Phenotypic structure of delay discounting in relation to diverse health behaviours in a general community sample of 10,701 adults

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Delay discounting (DD) is a decision-making phenotype in which higher DD reflects greater impulsivity. Excessive DD has been consistently associated with health behaviours, including substance use, other common psychiatric disorders, and obesity. As a phenotype, DD has been found to be heritable and may help elucidate how genetic factors contribute to disorder liability. However, the molecular genetics remain unclear, in part because studies have typically been underpowered and have not had a robust phenotype. The Healthy Nevada Project Cohort represents an opportunity to explore the genomic basis of DD using 10,701 adults. With this cohort we sought to characterize the phenotypic structure of DD by examining its relationship to clinical and health variables. Structural equation modelling explored relationships between DD and significant variables from Pearson r correlations. The model revealed excellent fit (CFI=0.998, TLI=0.997, RMSEA=0.015, SRMR=0.003), with significant positive associations between DD and smoking ($\beta=.032$, $p<.01$), BMI ($\beta=.106$, $p<.001$), substance use disorder ($\beta=.039$, $p<.01$), lifetime substance use ($\beta=.051$, $p<.001$), and anxiety ($\beta=.025$, $p<.05$), and significant negative associations between DD and income ($\beta=-.083$, $p<.001$). Alcohol frequency and severity were not significantly related to DD. Taken together, we found a robust association between DD and conditions associated with self-regulatory deficits (obesity and substance use), and anxiety, although not alcohol involvement. This study provides further evidence for the relevance of excessive DD as a health-related decision-making phenotype, sets the stage for genomic dissection in this dataset, and identifies appropriate targets for examining co-heritability and shared genetic mechanisms.