Regular exercise and anxious depression:
a bivariate genetic analysis with a categorical and a continuous trait

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Introduction:

In a previous study, we showed that the association between regular exercise and anxious depression is small but robust (De Moor et al. 2006, PM). This study aims to explore whether this (negative) association can be explained by a common genetic factor.

Sample:

❖ Twins and maximal 1 male and 1 female sibling, aged 18-50 years from the NTR (Boomsma et al. 2006, TRHG)

❖ N=6983 twins, 474 male sibs, 686 female sibs from 4,123 families (3,021 complete twin pairs)

Measures:

❖ Regular exercise Yes/No, based on cut-off criterion of 4 MET (Metabolic Equivalents) and 60 minutes weekly

❖ Anxious depression factor score, derived from Neuroticism and Somatic anxiety (EPQ), Anxiety (STAI), Anxious depression (YASR) and Depression (BDI) (Boomsma et al. 2000, TR)

❖ Cross-sectional data based on measurements in 1991, 1993, 1997, 2000 and 2002

Analyses:

Bivariate Cholesky decomposition in Mplus 4.21 (Muthén & Muthén) with one categorical and one continuous variable
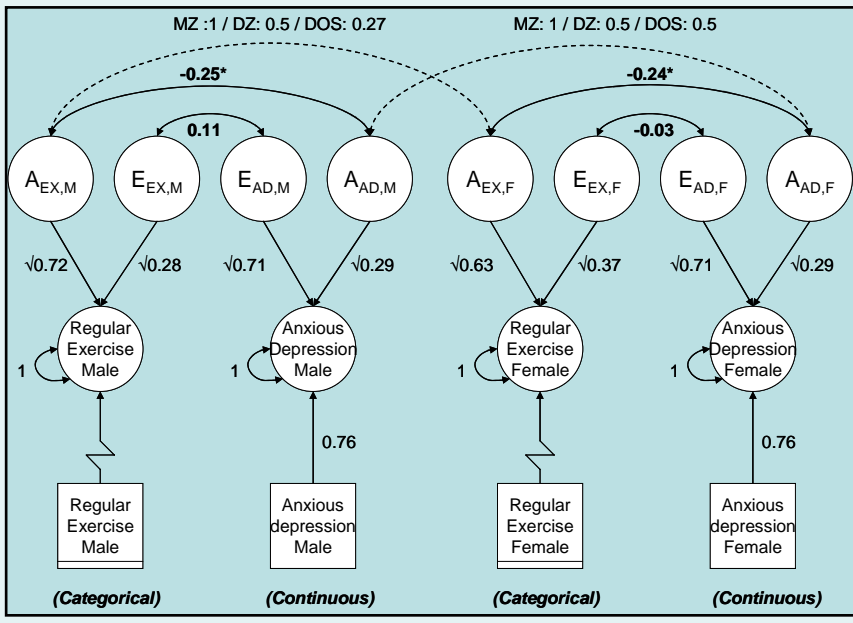
Results:

The phenotypic correlation is -0.10*.

Table 1. Twin & cross-trait cross-twin correlations (R) for regular exercise (EX) and anxious depression (AD)

	R twin EX	R twin AD	R cross EX-AD
MZM	0.72*	0.34*	-0.10*
DZM	0.38*	0.12*	-0.04
MZF	0.61*	0.34*	-0.12*
DZF	0.36*	0.12*	-0.04
DOS	0.17*	0.12*	-0.04

*p<0.01

Figure 1. Path model of bivariate Cholesky decomposition drawn for a DOS pair (including parameter estimates)

Conclusions:

❖ The small but robust phenotypic correlation between regular exercise and anxious depression is fully explained by common genetic factors.

❖ The genetic correlation between regular exercise and anxious depression is -0.25 in males and -0.24 in females.