

Using twin-family models to study genetic and environmental influences on cigarette smoking and (mental) health – PhD project



Jorien L Treur, Dorret I Boomsma, Jacqueline M Vink; Biological Psychology / Netherlands Twin Register, VU University Amsterdam

E-mail: j.l.treur@vu.nl

Background

The complex interplay between genetic and environmental influences on smoking behavior is not yet clear. In addition, many studies report on the association between smoking and (mental) health problems.

Extended twin models can provide a better insight into genetic and environmental influences on smoking and its relationship with (mental) health.

Aims

- ❖ Further explore the heritability of smoking behavior with (extended) twin models.
- ❖ Study the relationship between smoking and (mental) health.
- ❖ Measure the genetic overlap in the use of different substances.

Paper: Smoking during adolescence as a risk factor for attention problems

In a *discordant MZ co-twin design*, the smoking twin consistently scored higher on ADHD symptoms compared to the non-smoking co-twin.

Longitudinal data showed a causal (negative) influence of smoking on ADHD symptoms, lasting into adulthood. *See Figure 1*



Paper: The predictive value of smoking expectancy

A single question on smoking expectancy (“Do you think you’ll smoke in a year’s time?” with answers ranging from “certainly not” to “absolutely yes” on a 5-point scale) helps predict future smoking status, especially in former and never smokers.

Variation in how well subjects predict their future smoking behavior is influenced by genetic factors (59% in adolescents vs. 27% in adults).

Nicotine & Tobacco Research (2014) 16 (3):359-68

ERC Starting Grant 284167 “Beyond the Genetics of Addiction”

Subjects

All subjects are participants of the *Netherlands Twin Register*, which has been collecting data from twins and their family members since 1987.

Data collection

New surveys are sent to > 60,000 adult participants (10th wave of data collection), containing questions on smoking, alcohol use, caffeine intake (including soft & energy drinks), cannabis and other types of drug use

In addition, existing longitudinal data of both adolescents and adults will be used.

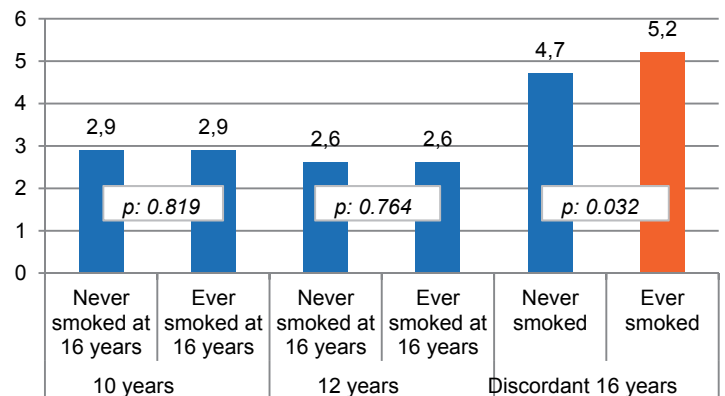


Figure 1: Scores on attention problems for 123 adolescent MZ twin pairs when discordant for smoking at 16 years (*Youth Self Report*) and at 12 and 10 years old (*Child Behavior Checklist*)

Future plans / in progress

Stability in smoking behavior

Transitions in smoking status and number of cigarettes smoked (in smokers) over time will be investigated using *longitudinal data*.

Assortative mating for smoking and depression

By including twins and spouses of twins, the relationship between smoking and depression and the role of *assortative mating* will be explored.

Smoking and caffeine consumption

By using a *bivariate twin model*, genetic and environmental influences on smoking and caffeine consumption and their overlap will be measured.