cruteted from the Australian NHMRC (National Health and Medical Research Council) Twin Registry, a nationwide, population-based volunteer registry. Information on zygosity came from the mothers' report of the twins' physical similarity. The mothers of the twin and sibling pairs filled out a questionnaire assessing the 14 DSM-III-R ADHD symptoms, 6 CD symptoms, and 4 ODD symptoms. The DeFries and Fulker (DF) multiple regression analysis of twin data (1985, Behav. Genet. 15, 467–473) and its extensions were used to test for genetic and environmental influences on ADHD and their moderation by CD and ODD symptoms. The results suggest that h² for ADHD decreases and c² for ADHD increases as antisocial behavior increases. An accurate picture of the moderating effects of antisocial behavior on the etiology of ADHD emerged only when the full range of both twins' CD and ODD symptoms were considered.

Marjolein J. H. Rietveld,135 J. R. Koopmans,135 H. H. Maes,135 and D. I. Boomsma.135 Genetic and Environmental Influences on Alcohol Use and Smoking by Maternal Religious Involvement in Dutch Adolescent Twins.135 The question considered in the present study is whether the contribution of genetic and environmental factors on alcohol use and smoking varies between populations of different religious involvement. A total of 1974 Dutch twin pairs (aged 12 to 27 years) and their parents filled out a questionnaire on alcohol use, smoking, and aspects of religious affiliation. For alcohol use a significant sex difference was observed: nearly 70% of the boys and 63% of the girls were considered drinkers. About 30% of both sexes reported being smokers. Twins were divided into three subgroups based on the religious involvement by their mother: not religious (28%), religious but not actively involved (32%), and involved in religious activities (40%). No significant difference in the prevalence of alcohol use was observed between subgroups. Smoking in adolescents differed as a function of religious involvement by the mother; fewer boys and girls indicated tobacco use when their mother was religious and involved in church activities. Genetic analyses were carried out on the three subgroups. The contribution of genetic and environmental factors on alcohol use in twins of mothers involved in religious activities (h² = 0%, age = 63%, c² = 26%, e² = 11%) differed significantly from those in adolescents of mothers less religious involved (h² = 24%, age = 47%, c² = 22%, e² = 8%). No differences in the determinants of smoking between the subgroups were found (boys: h² = 43%, age = 22%, c² = 22%, e² = 14%; girls: h² = 6%, age = 15%, c² = 67%, e² = 13%).

Lawrence A. Rodriguez,136 David A. Blizard,137 Lisa M. Taran tino,137 G. E. McClern,138 and George R. Uhl.136,138 Interval Mapping of QTL in RI Mice Using the MQTL Software Package. Mouse RI QTL analysis has most often been conducted using single-point mapping (SPM) procedures. SPM, however, is limited when analyzing chromosomal regions that are not densely mapped. In the BXD/Ty panel, there are sufficient "linkage gaps" within various chromosomes such that estimated intervals between informative markers can exceed 30 cM. In such circumstances, SPM may be inefficient in detecting QTL or result in biased QTL locations since QTL effect size and position are confounded. Interval mapping (IM) approaches to RI QTL analysis offer the advantage that QTL location and effect size are independently estimated (Markel et al., 1996, Behav. Genet. 26, 447–458). In addition, for any two adjacent loci, information from RI strains showing recombination between the two loci (e.g., the A1A,B,B and A1A,B,B, recombinant genotypes) is taken into account when testing for the presence of a QTL. Such information on recombinants is ignored in SPM. Until recently, there was no easily accessible and "user-friendly" computer program available to conduct QTL interval mapping analysis using mouse RI data. Now two such programs are available: Manly's Map Manager QT and Tinker and Mather's MQTL software package. Both Map Manager QT and MQTL feature options for interval mapping with or without background markers (composite interval mapping). MQTL, however, has additional options for examining QTL by environment interactions and epistasis, and can potentially be used on a wider variety of computer operating systems. The features of the highly flexible MQTL program and its application using BXD data will be demonstrated.

R. J. Rose,139 R. J. Viken,139 J. Kaprio,139 and M. Koskenvuo.139 Alcohol-Related Attitudes in Adolescence: Familial Aggregation and Predictive Utility.139 This is a report of alcohol-related attitudes from FinnTwin 16, a longitudinal appraisal of consecutive cohorts of Finnish twins, studied within 60 days of their 16th birthday. Ascertainment is unbiased, and compliance is very high. Across the first four cohorts, pairwise response rates, across both zygosities and both sexes, exceed 88%. Included in the baseline questionnaire is a set of alcohol attitudes taken from Finnish epidemiological work that demonstrates more positive attitudes are correlated with a higher frequency of self-reported consumption. Our twin-family data enable us to ask two additional questions: Do the attitudes exhibit familial aggregation, attributable, in part, to share genetic dispositions? and Will attitudes at age 16 predict trajectories of use/abuse over the next 30 months of development? Parent–child resemblance is consistent (.25–.35) and statistically significant across all parent–offspring relationships; spouse resemblance is highly significant (.70–.80) and the twin correlations for concordantly drinking co-twins at age 16 reveal genetic influences on acquisition of attitudes. Additionally, follow-up data reveal that attitudes predict trajectories of drinking over the next 30 months and predict also alcohol-related problems at age 18.5.

David C. Rowe,142 Craig Stever,142 Hobart H. Cleveland,142 Matthew L. Sanders,143 Ann Abramowitz,144 Susan Kozel,144 Jennifer

133 Department of Psychophysiology, Vrije Universiteit, De Boelelaan 1111, 1081 HV Amsterdam, The Netherlands.
134 Department of Human Genetics, Medical College of Virginia, Richmond, VA 23298.
135 Supported by the Dutch Heart Foundation and Medical Research NWO (Grant NWO 904-61-072).
136 Molecular Neurobiology Branch, National Institute on Drug Abuse, Intramural Research Program, P.O. Box 5180, Baltimore, MD 21224.
137 Center for Developmental and Health Genetics, The Pennsylvania State University, University Park, PA 16802.
138 Departments of Neurology and Neuroscience, The Johns Hopkins University School of Medicine, Baltimore, MD 21205.
139 Department of Psychology, Indiana University, Bloomington, IN 47405.
140 Department of Public Health, University of Helsinki, 00014 Helsinki, Finland.
141 Supported by AA08315 and AA07611 and by a Research Scientist Award, AA00145, to R. J. R.
142 School of Family and Consumer Resources, University of Arizona, Tucson, AZ 85721.
143 Department of Psychiatric and Behavioral Sciences, Emory University, Atlanta, GA 30322.
144 Department of Psychology, Emory University, Atlanta, GA 30322.