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A TWIN STUDY OF PERSONALITY, SOCIAL ATTITUDES
AND DRINKING BEHAVIOUR

Thesis submitted for the degree of
Doctor of Philosophy
at the Australian National University
by
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DECLARATION

This thesis contains no material which has been accepted for the award of any other degree or diploma at any University. Although the data used in this thesis were obtained through a National Health and Medical Research Council grant to Dr J.D. Matthews, University of Melbourne; Dr J.B. Gibson, Australian National University and Dr N.G. Martin, Australian National University (presently Medical College of Virginia), all the work reported herein is entirely my own.

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ABSTRACT

A genetic and environmental analysis of personality, social attitudes and drinking behaviour in 3810 pairs of adult twins is reported.

Individual differences in the personality traits of psychoticism, neuroticism and lie can be explained by the additive effects of genes and individual environmental differences. The contribution of these effects, however, depends on age and sex. For extraversion there is also evidence that either dominance or sibling competition is important. There is no evidence for the importance of shared family environment in determining variation in personality. It is possible to distinguish between major aspects of personality both factor-analytically and in terms of their patterns of variation, and this is reflected at both the item and trait level.

Extensive power calculations were conducted to examine the ability of different experimental designs to discriminate between the effects of genetic dominance and sibling interaction. Our results show that discrimination between these effects is unlikely to prove feasible by model-fitting techniques. Other methods for the resolution of these effects are discussed.

Analysis of the causes of covariation between the personality trait of neuroticism, and symptoms of anxiety and depression, shows that genetic variation in anxiety and depression is largely dependent on the same genes which determine variation in the trait of neuroticism. Furthermore, additive genetic factors are more important than individual environmental factors in the covariation of these measures. There is no

evidence for the importance of environmental experiences shared by cotwins, such as common family environment or social influences.

Similar to our results for personality traits and symptoms, our analyses of the causes of variation in conservatism, at both the item and trait level, provide strong support for the importance of the additive effects of genes. In contrast to personality measures, however, there is substantial assortative mating for conservatism which results in inflated estimates of the shared environmental effect in twin data. We show that by fitting models which directly estimate the effects of genetic and cultural inheritance in the presence of phenotypic assortative mating, there is no evidence for the importance of family environment.

Our analysis of data relating to drinking habits provides some support for the role of family environment in the development of normal drinking behaviour. We also find that there are significant genetic effects on twin resemblance in drinking behaviour, and that the effects of genes and environment depend significantly on age, sex, and for alcohol consumption in females, marital status. One method for modelling changes in the sources of variation with age is illustrated with data relating to alcohol consumption.

Possibilities for future research based on the results of each of these analyses are discussed.