

Contents

List of Tables and Figures	vii
Series Editor's Preface	xi
Preface	xiii
1 Introduction	1
Plan of the Book	2
Some Basic Concepts	3
2 Behavior Genetic Methods: Application to Extraversion	9
MZ and DZ Twins: Basic Model Fitting	11
Alternative Models and Assumptions for Twin Data	21
Adoptions and Other Twin and Family Designs	30
Combined Model Fitting	42
Conclusions	45
3 Genes, Environment, and the Big Five Personality Traits	47
The Big Five	48
The Big Five Compared	66
Conclusions	68

4	Levels of Analysis: General or Specific?	69
	Three Aspects of Extraversion	70
	The Heritability of Questionnaire Items	78
	Conclusions	80
5	Heredity, Environment, and Change	81
	Cross-Sectional Studies	82
	Longitudinal Studies	96
	Conclusions	103
6	Complexities and Contexts	105
	Correlation and Interaction of Genes and Environment	105
	Personality and Other Trait Domains	114
	Evolution, Human Nature, and Individual Differences	117
	Conclusions	125
	Symbols Used in Equations and Figures	127
	References	129
	Index	137
	About the Author	145

Tables and Figures

Figure 2.1 Path Models of MZ and DZ Twin Correlations	13
Table 2.1 Extraversion Correlations for MZ and Same-Sex DZ Pairs in Five Large Twin Studies, and h^2 and c^2 Estimates Based on Simple Twin Model	15
Table 2.2 Some Models Fit to MZ and DZ Twin Correlations for Extraversion	18
Figure 2.2 Alternative MZ-DZ Twin Model: Contrast Effects	22
Figure 2.3 Alternative MZ-DZ Twin Models: Nonadditive Genetic Variance	23
Table 2.3 Equations for MZ and DZ Twins, Nonadditive Genetic Variance	24
Figure 2.4 Alternative MZ-DZ Twin Models: Unequal Shared Environmental Effects	26
Table 2.4 Extraversion Correlations in Three Adoption Studies	32
Figure 2.5 Path Model of Biological Family (Left) and Adoptive Family (Right)	33
Table 2.5 Equations for Adoption Studies	35
Table 2.6 Some Models Fit to Adoption Study Correlations for Extraversion	36
Table 2.7 Extraversion Correlations in Two Twin-Family Studies	37
Table 2.8 Equations for Twin-Family Studies	37
Figure 2.6 Path Model for a Twin-Family Study	38
Table 2.9 Some Models Fit to Twin-Family Correlations for Extraversion	39
Table 2.10 Extraversion Correlations in Four Studies of Separated Twins	40
Table 2.11 Equations for Studies of Separated Twins	40
Figure 2.7 Path Models for Twins Reared Together and Apart	41
Table 2.12 Some Models Fit to Extraversion Correlations from Studies of Separated Twins	42

Table 2.13 Some Models Fit to Extraversion Correlations from Four Twin Studies, Three Adoption Studies, Two Twin-Family Studies, and Four Studies of Separated Twins	43
Table 2.14 More Models Fit to Combined Extraversion Correlations: Sex Differences in a Model with h^2 , i^2 , and c_{MZ}^2	45
Table 3.1 The Big Five Dimensions of Personality	49
Table 3.2 Adjectives Characterizing the Big Five Personality Dimensions	50
Table 3.3 Estimates from Fitting Two Simple Models to Extraversion Data	52
Table 3.4 Neuroticism Correlations for MZ and Same-Sex DZ Pairs in Five Large Twin Studies	53
Table 3.5 Neuroticism Correlations in Three Adoption Studies	53
Table 3.6 Neuroticism Correlations in Two Twin-Family Studies	54
Table 3.7 Neuroticism Correlations in Four Studies of Separated Twins	54
Table 3.8 Some Models Fit to Neuroticism Correlations from Four Twin Studies, Three Adoption Studies, Two Twin-Family Studies, and Four Studies of Separated Twins	55
Table 3.9 More Models Fit to Combined Neuroticism Correlations: Sex Differences in a Model with h^2 , i^2 , and c_{MZ}^2	56
Table 3.10 Estimates from Fitting Two Simple Models to Neuroticism Data	56
Table 3.11 Twin Studies of Measures Related to Agreeableness	57
Table 3.12 Adoption and Family Studies of Measures Related to Agreeableness	59
Table 3.13 Estimates from Fitting Two Simple Models to Agreeableness Data	60
Table 3.14 Twin Studies of Measures Related to Conscientiousness	62
Table 3.15 Adoption and Family Studies of Measures Related to Conscientiousness	63
Table 3.16 Estimates from Fitting Two Simple Models to Conscientiousness Data	64
Table 3.17 Twin Studies of Measures Related to Culture/Openness	65
Table 3.18 Adoption and Family Studies of Measures Related to Culture/Openness	66
Table 3.19 Estimates from Fitting Two Simple Models to Culture/Openness Data	66
Table 3.20 Summary: Estimates from Fitting Two Simple Models to Data from Big Five Traits	67
Table 4.1 Multigroup Analysis of Impulsivity, Dominance, and Sociability Scales	71
Table 4.2 Correlations for Impulsivity, Dominance, and Sociability Scales, Plus Mean Correlation in 30 Groups	72
Table 4.3 Models Fit to Combined Data on Impulsivity	73
Table 4.4 Models Fit to Combined Data on Dominance	74
Table 4.5 Models Fit to Combined Data on Sociability	75

Table 4.6 Models Fit to Combined Data on Extraversion (Average of Three Traits)	76
Table 4.7 χ^2 s Based on Same Versus Different Parameters for the Two Questionnaires	76
Table 4.8 Parameter Estimates for Some Two- and One-Parameter Solutions for Extraversion-Related Traits	77
Table 5.1 Correlations Between Age and Twin Resemblance for Various Personality Traits	84
Table 5.2 Adult Twin Correlations by Age Groups—Scandinavian Studies	87
Table 5.3 Twin Correlations for Finnish MZs Living Together in 1975 but with Varying Degrees of Separation in 1981	88
Table 5.4 Estimates of Genetic and Shared Environmental Variance for Personality Traits in Older Twins, Swedish Adoption/Twin Study on Aging	91
Table 5.5 Twin Correlations from Neonatal Temperament Assessment	93
Table 5.6 Twin Resemblance During the First Year of Life—Median MZ and DZ Correlations	94
Table 5.7 Twin Resemblance During the Second Year of Life—Median MZ and DZ Correlations	96
Table 5.8 Correlations of MZ and DZ Patterns of Change Across Age—Louisville Twin Study	97
Table 5.9 Correlations of 2-year Change Scores for Adult Twins, Great Britain	99
Table 5.10 Correlations of 5-year Change Scores for Young Adult Twins, Indiana	100
Table 5.11 Correlations of 10-year Change Scores for Adoptive and Biological Siblings, Texas	101
Table 5.12 Means on Parent Rating Composites for Adopted and Biological Children in Texas Adoption Study at Original Testing and 10-year Follow-up	103
Table 6.1 Estimates of Passive Genotype-Environment Covariance for Five Traits in Two Adoption Samples via Correlations and Standard Deviations	107
Table 6.2 Correlations of Ratings of Family Environment on Affection and Control Dimensions by Twin and Sibling Pairs	112
Table 6.3 Model Fitting to the Correlations of Table 6.2	113
Table 6.4 Typical Correlations from Several Trait Domains, National Merit Twin Study, and Implied Estimates of Heritability and Shared Environment	116